NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Appendix 13.1 Offshore Ornithology Consultation

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Glossary of Acronyms

AEoI	Adverse Effect on Site Integrity
BDMPS	Biologically Defined Minimum Population Scales
BSH	Bundesammt für Seeschifffahrt und Hydrographie
BTO	British Trust for Ornithology
CD	Chart Datum
CRM	Collision Risk Modelling
DCO	Development Consent Order
EA1N	East Anglia One North
EIA	Environmental Impact Assessment
ES	Environmental Statement
ETG	Expert Topic Group
EU	European Union
FFC	Flamborough and Filey Coast
GSD	Ground Sample Distance
HAT	Highest Astronomical Tide
HRA	Habitats Regulations Assessment
LAT	Lowest Astronomical Tide
MHWS	Mean High Water Springs
MSL	Mean Sea Level
NE	Natural England
NFOW	North Falls Offshore Wind Farm Limited
NMCs	Non-Material Changes
NSIP	Nationally Significant Infrastructure Project
OTE	Outer Thames Estuary
OWF	Offshore Wind Farm
PCH	Potential Collision Height
PEIR	Preliminary Environmental Information Report
PVA	Population Viability Analysis
RIAA	Report to Inform Appropriate Assessment
RTD	Red Throated Diver
sCRM	Stochastic Collision Risk Modelling
SD	Standard Deviation
SeaMAST	The Seabird Mapping and Sensitivity Tool
SNCB	Statutory Nature Conservation Body
SoS	Secretary of State
SPA	Special Protection Area
WTG	Wind Turbine Generator

Glossary of Terminology

Array area	The offshore wind farm area, within which the wind turbine generators, array cables, platform interconnector cable, offshore substation platform(s) and / or offshore converter platform will be located.
As-built	A term used for offshore wind farm developments that are operational and where the turbine array 'as built' is different to the worst case scenario in the Environmental Impact Assessment for the development (for example where a wind farm is built out with fewer turbines than the consented design envelope).
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and information to support the HRA through ETG meetings.
Landfall	The location where the offshore export cables come ashore at Kirby Brook.
Migration free breeding season mitigation	The breeding season for migratory seabird species is defined as a wider breeding season and a narrower window known as the migration free breeding season. In a given species, the timing of breeding will vary depending on the location of the breeding area; with the start of breeding usually later in more northerly locations. Thus, while birds at some colonies are beginning to nest, others may still be migrating to breeding sites. A core or migration free breeding season is defined as the period when all or the majority of breeding adults of a given species are present at breeding colonies.
Offshore cable corridor	The corridor of seabed from the array area to the landfall within which the offshore export cables will be located.
Offshore converter platform	Should an offshore connection to a third party HVDC cable be selected, an offshore converter platform would be required. This is a fixed structure located within the array area, containing HVAC and HVDC electrical equipment to aggregate the power from the wind turbine generators, increase the voltage to a more suitable level for export and convert the HVAC power generated by the wind turbine generators into HVDC power for export to shore via a third party HVDC interconnector cable.
Offshore export cables	The cables which bring electricity from the offshore substation platform(s) to the landfall, as well as auxiliary cables.
Offshore substation platform(s)	Fixed structure(s) located within the array area, containing HVAC electrical equipment to aggregate the power from the wind turbine generators and increase the voltage to a more suitable level for export to shore via offshore export cables.
Platform interconnector cable	Cable connecting the offshore substation platforms (OSP); or the OSP and offshore converter platform (OCP).
The Applicant	North Falls Offshore Wind Farm Limited (NFOW)
The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Wind turbine generator	Power generating device that is driven by the kinetic energy of the wind

1 Offshore Ornithology Consultation

1. This appendix includes consultation comments and responses relating to the offshore ornithology Environmental Impact Assessment (EIA), including baseline surveys, and Habitats Regulations Assessment (HRA) that have been received as a response to the following documents:

   - Digital video aerial surveys of seabirds and marine mammals at North Falls Offshore Wind Farm (herein 'North Falls'): Annual report for March 2019 to February 2020 (First Year Survey Report, dated 5 October 2020);
   - Digital video aerial surveys of seabirds and marine mammals at North Falls: Two-year report March 2019 to February 2021 (Second Year Survey Report, dated 7 September 2021);
   - EIA and HRA Outline Methodology – Offshore Ornithology (dated 2 July 2021);
   - North Falls Scoping Report (dated 16 July 2021);
   - Red throated diver (RTD) assessment for North Falls – outline method statement (dated 9 June 2022);
   - RTD at North Falls – proposed modelling approach to predict abundance within 12km buffer for assessing operational displacement (dated 14 July 2022);
   - North Falls Third Expert Topic Group (ETG), presentation and minutes;
   - Preliminary Environmental Information Report (PEIR) and Draft Report to Inform Appropriate Assessment (RIAA); North Falls Statutory Consultation under Section 42 of the Planning Act 2008 and Regulation 13 of Infrastructure Planning (Environmental Impact Assessment Regulation 2017); and
   - Red-throated diver in combination assessment memo.

2. The consultation comments are listed by consultee and document. Responses indicate where a particular comment has been addressed in the Application documents, where appropriate. References are included in the reference list in Environmental Statement (ES) Chapter 13 Offshore Ornithology (Section 13.12) (Volume 3.1) (Document Reference: 3.1.15).

3. Consultation relating to offshore ornithology has also been undertaken in relation to the HRA. Comments and responses relating to HRA matters are provided in the following documents:

   - RIAA Part 4 Offshore Ornithology (Volume 7) (Document Reference: 7.1.4);
   - HRA Screening Report (RIAA Appendix 1; Document Reference: 7.1.1);
   - Habitats Regulations Derogation: Provision of Evidence (Document Reference: 7.2); and
   - HRA Compensation Consultation (HRA Derogation Annex 1A; Document Reference: 7.2.1.1).

4. In addition to the exchange of written documents, consultation with key stakeholders, Natural England and RSPB, has also been undertaken through ETG meetings on the following dates:

- 19 July 2021;
- 17 March 2022;
- 27 March 2023;
- 13 November 2023; and
- 11 April 2024.

1.1 Natural England

1.1.1 Natural England comments on first year survey report

5. Letter from Natural England, 29 March 2021 (Reference Case: 14332, Consultation: 346712), with comments on Digital Video Aerial Surveys of Seabirds and Marine Mammals at North Falls: Annual Report for March 2019 to February 2020. Document No. HP00101-701-01 (05 October 2020)

Section (of response)	Comment	Response	Where addressed in Development Consent Order (DCO) application
Point 1, page 1	The proposed NFOW is located approximately 2-3km from the Outer Thames Estuary SPA. Therefore, we are concerned that given the proximity of the OWF to the Outer Thames Estuary, displacement effects on red-throated diver will result in a long-lasting reduction in the availability of diver habitat in part of the SPA and a change of the distribution of divers within the SPA. In turn, this would result in an adverse effect on site integrity (AEoI), both alone and in-combination with other plans and projects. We advise that NFOW give this immediate consideration and we recommend they follow the advice we have recently provided during the East Anglia One North (EA1N) examination.	North Falls Offshore Wind Farm Ltd (NFOW) has undertaken detailed consultation with Natural England over the methodology for the shadow appropriate assessment of red-throated diver displacement within the Outer Thames Estuary (OTE) Special Protection Area (SPA) and development of compensatory measures.	RIAA Part 4 (Document Reference: 7.1.4), Section 9.2.3.1; RIAA Appendix 4.1; HRA Derogation Provision of Evidence (Document Reference: 7.2); Red-throated Diver Compensation Document (Document Reference: 7.2.3)
Point 1, page 2	The proposed NFOW is located within the mean-maximum foraging range of lesser black-backed gull (Woodward et al. 2019) of the Alde-Ore Estuary SPA. Therefore, there is the potential that birds recorded within the proposal site during the breeding season will be breeding birds from this colony. Birds from the colony may also interact with the proposal outside the breeding season (e.g. on migration). During the recent Norfolk Vanguard and Norfolk Boreas OWF examinations and in the ongoing East Anglia One North and East Anglia Two OWFs, we have advised that an AeoI cannot be ruled out in respect of lesser black-backed gull at Alde-Ore Estuary SPA in-combination with other plans and projects. Therefore, any additional mortality arising from this proposal would be considered adverse.	It is recognised that some recent consents for OWFs in the UK southern North Sea have been granted on the basis of derogation and compensation measures for lesser black-backed gull at the Alde-Ore Estuary, reflecting the view of Regulators that the magnitude of current in combination effects from OWFs (collision risk) represents an AeoI. A review of options for compensatory measures for lesser black-backed gulls at the Alde Ore Estuary SPA was included alongside the draft RIAA, submitted with the PEIR. An HRA derogation case, including compensation proposals for lesser black-backed gull at the Alde-Ore Estuary is provided with the DCO application.	RIAA Part 4 (Document Reference: 7.1.4) Section 9.3.3.1; HRA Derogation Provision of Evidence (Document Reference: 7.2)

Section (of response)	Comment	Response	Where addressed in Development Consent Order (DCO) application
Point 1, page 2	Whilst the proposed NFOW may be located outside of foraging range of kittiwakes breeding at the Flamborough and Filey Coast (FFC) SPA, there is the potential for birds from this site to interact with the proposal outside of the breeding season (e.g. on migration). We highlight that the in-combination total of collision mortality across consented plans/projects has already exceeded levels which are considered to be of an AEoI to kittiwake at FFC SPA, and that any additional mortality arising from the proposal would therefore be considered adverse.	It is recognised that some recent consents for OWFs in the UK southern North Sea have been based on derogation and compensation measures for kittiwake at the FFC, reflecting the view of Regulators that the magnitude of current in combination effects from OWFs (collision risk) represents an AEoI. A review of options for compensatory measures for kittiwakes at the FFC SPA was included alongside the PEIR. Evidence to support an HRA derogation case, including compensation proposals for kittiwake is provided with the DCO application.	RIAA Part 4 (Document Reference: 7.1.4) Section 9.4.3.1; HRA Derogation Provision of Evidence (Document Reference: 7.2)
Point 1, page 2	The scale of potential cumulative (EIA scale) impacts in the North Sea are also of concern, and the proposed project will contribute to these totals. It should be noted that during the recent Norfolk Vanguard and Norfolk Boreas examinations and the ongoing East Anglia One North and East Anglia Two examinations, we have been unable to rule out a significant adverse effect for cumulative operational displacement on red-throated diver, razorbill or guillemot at the EIA scale. The scale of predicted collision impacts from existing and proposed windfarms has already led us to conclude that significant impacts cannot be ruled out for kittiwake, gannet and great black-backed gull cumulatively at EIA level.	The advice is noted and these issues are considered further on a species / effect basis in the cumulative assessment.	ES Chapter 13 Offshore Ornithology, Section 13.7.3 (Document Reference: 3.1.15)
Point 1, page 2	We note that in the Secretary of State's (SoS) decision letter for Vanguard, the SoS stated: 'that it is important that potential AEoI of designated sites are identified during the pre-application period and full consideration is given to the need for derogation of the Habitat Regulations during the Examination. He expects Applicants and statutory nature conservation bodies ("SNCBs") to engage constructively during the pre-application period and provide all necessary evidence on these matters, including possible compensatory measures, for consideration during the Examination.' Therefore, based on the points above, we strongly recommend that NFOW give consideration to this and to development of in principle compensation measures for the Outer Thames Estuary SPA, Alde-Ore Estuary SPA and FFC SPA before submission of their application to the Planning Inspectorate.	A review of options for compensatory measures for red-throated diver at the OTE SPA, lesser black-backed gull at the Alde-Ore Estuary SPA, and kittiwake at the FFC SPA was included alongside the PEIR. Evidence to support an HRA derogation case is provided with the DCO application.	HRA Derogation Provision of Evidence (Document Reference: 7.2); Compensation Documents are provided for: • Lesser black-backed gull (Document Reference: 7.2.2); • Red-throated diver (without prejudice) (Document Reference: 7.2.3):

Section (of response)	Comment	Response	Where addressed in Development Consent Order (DCO) application
			• Kittiwake (without prejudice) (Document Reference: 7.2.4): and • Guillemot and razorbill (without prejudice) (Document Reference: 7.2.5).
2.1, page 2-3	We note that the surveys have covered a total of 16 transects, spaced 2.5km apart, covering the NFOW site plus 4km buffer around the proposed array. A minimum target of 10% coverage was set based on agreement on survey effort between HiDef and NFOW, with up to 15% coverage attained for 9 of the surveys. We understand from the clarification letter from NFOW of responses to our previous advice regarding the methodology that this 10% - 15% split in survey coverage is deemed by NFOW and HiDef to provide the optimal balance between ensuring an adequate level of precision in baseline surveys and managing the level of survey effort and cost. However, no detailed information has been provided on how the survey design (16 transects, 2.5km apart and a minimum of 10% coverage) was arrived at. Surveys need to have been designed to collect a representative sample on bird density across the survey area. Independent samples are typically considered to be individual transects or survey grids. Too little coverage and/or too few independent samples may lead to density estimates lacking in accuracy and/or precision. This can result in inaccurate estimates of abundance and distribution, potentially with wider confidence intervals than would be attained with more comprehensive sampling. This in turn can lead to a wider range of estimates of potential impacts and reduce the future ability to detect changes in bird abundance and distribution. To determine whether survey coverage and design would provide an adequate baseline characterisation, we would expect that evidence from a power analysis of existing data sets be used. If at the examination stage the survey design and/or percentage coverage are questioned by the Examining Authority NFOW may need robust evidence as to how they came to this conclusion	There has been detailed correspondence between Natural England and NFOW on this comment and survey coverage has been increased to 15% for all surveys. It is understood that Natural England is content with this level of coverage and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)

Section (of response)	Comment	Response	Where addressed in Development Consent Order (DCO) application
2.1, page 3	The surveys were undertaken using an aircraft equipped with 4 cameras with sensors set to a resolution of 2cm Ground Sample Distance (GSD). Each camera sampled a strip of 125m width, separated from the next camera by ~25m, which provides a combined sampled width of 500m within a 575m overall strip. Whilst images were collected from a total of 4 cameras, images were only processed from 3 of these cameras for 9 of the monthly surveys and only 2 of these cameras for 3 of the monthly surveys. We note that the Year 1 report states that the images from 3 cameras were processed for 9 surveys due to concurrent surveys across Galloper PCM. Further clarification is required as to the reasoning behind why data from 3 cameras could not be processed for the remaining 3 surveys as well and why data are not processed from all 4 cameras.	There has been detailed correspondence between Natural England and NFOW on this comment and survey coverage has been increased to 15% for all surveys. To achieve this, images from three cameras have now been processed for all surveys. It is understood that Natural England is content with this level of coverage and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)
2.1, page 3	We note that if all data collected had been analysed (i.e. from all 4 cameras) for each monthly survey to generate density and population estimates for species there would have been coverage of approximately 20% of the survey area for each survey. Whilst the level of coverage that can be considered to be sufficient for baseline characterisation, this will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. However, if a narrower transect width is used for surveys (e.g. 250m transect width for 2 cameras, or a 375m width for 3 cameras, rather than a 500m width for all 4 cameras) then it is likely that a larger number of transects will be needed to achieve the same level of precision as would be derived from a sample of wider transects (Buckland et al. 2012; Thaxter & Burton 2009). We also note that from Tables 11-34 the level of precision (%CV) for most species or species groups are fairly high, i.e. precision is generally low. We acknowledge that this may be dependent on the densities of the birds present at the site. Whilst the clarification letter from NFOW of responses to our previous advice regarding the methodology states that: '*increasing analysed coverage beyond the current level is not anticipated to result in useful gains in the level of precision figure achieved from the existing survey design and level of analysis, and that in general, diminishing returns would be achieved with an increase in survey coverage analysed beyond the current level, offering little useful gain in precision for significant additional cost. As a result NFOW and HiDef do not believe*	There has been detailed correspondence between Natural England and NFOW on this comment and survey coverage has been increased to 15% for all surveys. As Natural England acknowledges, the distribution of seabirds in offshore areas is highly variable between surveys which is reflected in the high CV values from survey data. It is understood that Natural England is content with 15% coverage (data from 3 cameras) and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)

Section (of response)	Comment	Response	Where addressed in Development Consent Order (DCO) application
	there is site-specific justification for altering the current level of survey coverage beyond the current approach which is expected to provide an accurate characterisation of the site to in advance of potential future monitoring programme requirements.' However, we note that no information has been presented to show that an analysis was undertaken to look at the level of precision that could be achieved by analysing the full dataset collected (from four cameras) versus the reduced coverage selected by NFOW. Therefore, we recommend that analysis of the full dataset (all 4 cameras) is undertaken and presented, at least for some survey months or species, to compare the levels of precision from this compared to the reduced coverage currently used, in order to assess whether this makes a significant improvement to the levels of precision.		
2.1, page 4	Given the lack of precision in abundance estimates indicated by the Year 1 survey data it will be important that when it comes to the submission of the application that the assessments consider the uncertainty in the mean estimates by using the upper and lower confidence intervals around the mean values.	Project alone assessments have considered means and 95% confidence intervals of appropriate variables (e.g. collision risk predictions).	ES Chapter 13 Offshore Ornithology, Section 13.6 (Document Reference: 3.1.15)
2.1, page 4	The Year 1 Report states that no apportioning of 'partially identified' birds to species level was undertaken. We advise that this is undertaken on the final data set (i.e. 24 months) for use in assessments in final submission documents. This could be done by using the proportions of each of the species that make up the group recorded in the specific survey month and using these to apportion the unidentified individuals. We would recommend that confidence limits and precision estimates are also included.	The complete (24 months) data set used in the PEIR and ES has been subject to apportioning for records identified to species group but not to species. Confidence limits and precision estimates are also provided for the apportioned data.	ES Appendix 13.2 (Document Reference: 3.3.13)

1.1.2 Natural England comments on second year survey report

6. Letter from Natural England dated 8 October 2001 (reference DAS/14432/368057).

Section (of response)	Comment	Response	Where addressed in DCO application
1.1	Key comments/concerns regarding survey design and data analysis: North Falls states that '*the survey design for North Falls Offshore Wind Farm (NFOW) was based on use of the 4 camera HiDef rig to achieve 20% coverage of the survey area by surveying 16 parallel transects, spaced 2.5km apart. This design ensures that the recommended survey coverage of at least 10% by area of offshore wind development study sites for characterising bird density and abundance for site characterisation for EIA and HRA (Thaxter & Burton, 2009; BSH, 2013) is achievable*.' We note that Thaxter & Burton (2009) does not make specific reference to a minimum of 10% coverage being required. It does however, state under the HiDef methods section: '*Thus far coverage of 10% to 20% has been obtained in surveys, although it is anticipated that anything up to 100% or even over (multiple passes) may be feasible at some sites*.' We note that Bundesammt für Seeschifffahrt und Hydrographie (BSH) (2013) covers minimum requirements for surveys for offshore wind farms in German waters. There is currently no such document available for English waters, and Natural England has not previously endorsed a minimum requirement of 10% coverage for baseline characterisation surveys for offshore wind. It should be noted that the reliance on 10% survey coverage is a long running source of discussion within the OWF industry. The Statutory Nature Conservation Bodies (SNCBs) are keen to move towards a more informed, intelligent survey design, that considers how to ensure confidence in abundance figures for key species. Using an arbitrary 10% coverage guideline does not do that, as far as we are aware and we do not agree that this minimum level of coverage can be considered to be sufficient for baseline characterisation for all sites based on this having previously been accepted at other sites, as the requirements will depend on the nature of the area being surveyed and the abundance and distribution of receptors across the area. Power analysis is one way to explore the confidence we can place in the data gathered.	There has been detailed correspondence between Natural England and NFOW on this comment. It is accepted that there is no guidance which recommends the 10% survey coverage which has been used for baseline surveys of most UK OWFs to date. The desire of the SNCBs to move towards a more informed, intelligent survey design, that considers how to ensure confidence in abundance figures for key species is welcomed. It is also noted that baseline surveys are designed for site characterisation, rather than to provide a baseline to detect specific changes in seabird numbers and distribution in subsequent surveys. Additional data has been processed to provide 15% coverage in all monthly baseline surveys. It is understood that Natural England is content with 15% coverage (data from 3 cameras) and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)

Section (of response)	Comment	Response	Where addressed in DCO application
1.1	Further, if a narrower transect width is used for surveys (e.g., a 250m transect width rather than a 500m width) then it is likely that a larger number of transects will be needed to achieve the same level of precision as would be derived from a sample of wider transects (Buckland et al. 2012, Thaxter & Burton 2009). With regard to survey design and precision, Thaxter & Burton (2009) in their discussion on recommended protocols state: '*If the survey region is large, then precision depends not on the percentage of the area covered, but the number of flight lines flown (i.e., number of transect strips). Therefore, a fuller spread throughout the region would decrease standard error (Rexstad & Buckland 2009). Species with clumped distributions, such as sea ducks, may require a greater number of lines to increase the chances of hitting one of those "clumps" and this could be informed by a priori knowledge from characterisation surveys. Under visual aerial survey methods, the exact relationship between precision of population estimates and transect spacing is not known (Camphuysen et al. 2004), and was previously recommended as a further area of research (Maclean et al. 2009). Most conventional methods have used the lower 2000 m spacing limit suggested by Camphuysen et al. (2004); however, a minimum of 20 transect lines within the region was also suggested for visual surveys (Camphuysen et al. 2004). We would recommend that the same spacing and minimum number of transect lines also be considered for digital surveys, provided this can be achieved in one survey flight*'. The surveys undertaken at NFOW have covered 16 transects (of which 12 cover the array footprint) spaced 2.5km apart and for 18 months 3 cameras of data have been analysed (approx. 15% coverage), whilst for the remaining 6 months (October, November and January in both of the 2 years of survey) only 2 cameras of data have been analysed (approx. 10% coverage). We note that the NFOW survey design does not meet the minimum 20 transects recommended by Thaxter & Burton (2009) and the transects are spaced 0.5km further apart than the 2km spacing recommended in Thaxter & Burton (2009). We note that from Tables 42-89 of the Year 2 report the level of precision (%CV) for most species or species groups are fairly high, i.e., precision is generally low. We acknowledge that this may be dependent on the densities of the birds present at the site. Low precision reduces the confidence that can be placed in the mean. When considering estimated impacts, low	There has been detailed correspondence between Natural England and NFOW on this comment. It is noted that the baseline surveys were designed for site characterisation, rather than to provide a baseline to detect specific changes in seabird numbers and distribution in subsequent surveys. Additional data has been processed to provide 15% coverage in all monthly baseline surveys. It is understood that Natural England is content with 15% coverage (data from 3 cameras) and this issue is considered to be agreed. As Natural England acknowledge, the distribution of seabirds in offshore areas is highly variable between surveys which is reflected in the CV values from survey data.	ES Appendix 13.2 (Document Reference: 3.3.13)

Section (of response)	Comment	Response	Where addressed in DCO application
	precision will likely lead to Natural England (NE) placing greater emphasis on the upper CI in our interpretation of the results. This increases the risk of a conclusion of unacceptable impact to the populations in question.		
1.1	Noting that for at least three species, red-throated diver at Outer Thames Estuary Special Protection Area (SPA), kittiwake at Flamborough and Filey Coast SPA and lesser black-backed gull at Alde-Ore Estuary SPA, NE have already advised that the in-combination level of impact is likely to be at an adverse level (i.e., a conclusion that an adverse effect on site integrity cannot be ruled out). Therefore, it would seem proportionate to work towards obtaining abundance and density data that is as accurate and precise as is possible (within the confines of the survey data collected).	Additional data has been processed to provide 15% coverage in all monthly baseline surveys. It is understood that Natural England is content with 15% coverage (data from 3 cameras) and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)
1.2	NFOW basic exploration of the relationship between the precision of the monthly density estimates and the number of cameras used: Our understanding of this exploration is that NFOW have just undertaken a comparison of the CVs from all the surveys where 3 cameras were analysed (i.e., for surveys in February-September and December in both years = 18 surveys) against the CVs from all the surveys where only 2 cameras are analysed (i.e., surveys in October, November and January in both years = 6 surveys), which has been presented in the boxplots in Figures 1a and b and 2. We query the appropriateness of this comparison. How can data be compared when looking at different months as bird distribution and abundance will vary between these (and which can impact precision). The comparison of CVs and how they decline (or increase) with additional numbers of cameras of data analysed should be undertaken only for the same survey month and species – e.g., presentation of CVs for red-throated diver in January for 1 camera, 2 cameras, 3 cameras, 4 cameras.	The analyses referred to were intended to provide a general indication of the changes in CVs between data processed for 2 and 3 cameras. Additional data has been processed to provide 15% coverage (data from 3 cameras) in all monthly baseline surveys. It is understood that Natural England is content with 15% coverage and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)
1.2	We suggest consideration is also given to how the species are distributed within the site – are all the species (or the key species) clumped in distribution or widespread throughout site? As precision (CV) may be linked to distribution and/or densities. This could also be presented in any justification for the survey design being appropriate to suitably characterise the site.	Distribution maps for bird species recorded in the offshore surveys are presented in Appendix 13.5 (Volume 3.3)	ES Appendix 13.2 (Document Reference: 3.3.13)
1.3	Power Analysis: NFOW note that *'power analysis is an informative step in survey design when the purpose of the study is to detect trends/change in density/abundance. Such an analysis can provide*	It is noted that baseline surveys were designed for site characterisation, rather than to provide a	ES Appendix 13.2 (Document Reference: 3.3.13); In Principle

Section (of response)	Comment	Response	Where addressed in DCO application
	insight into the number of samples and precision required for a trend to be detected. But a prerequisite to running power analyses is a clear hypothesis of what is to be tested, including the amount of change and the period within which it is to be detected and the required statistical power.' Whilst we agree with this statement, we also note that the NFOW baseline surveys will form part of the analysis of impacts from the wind farm post consent (if the Project receives consent). Therefore, the survey design and sampling approach should be designed so that it will set a baseline to achieve the best power to detect trends/changes in the populations/distributions of key species within the North Falls site + buffer. This could have been informed by desk study of existing data (e.g., from the Galloper and Greater Gabbard OWF surveys). We would again recommend that power analysis should be presented to prove that the suggested design will provide the required robust population estimates.	baseline to detect specific changes in seabird numbers and distribution in subsequent surveys.	Monitoring Plan (Document Reference: 7.10)
1.4	As the 24 months of baseline surveys have been completed for NFOW, it is now too late to influence the survey design. We previously recommended that the applicant undertakes analysis of the full dataset from all 4 cameras, at least for some survey months or species, in order to assess whether this makes a significant improvement to the levels of precision. However, we cannot see any evidence presented that this analysis has been undertaken. Therefore, we again recommend testing the adequacy of data used, by analysing data from additional cameras (including for up to 4 cameras) in a selection of relevant months, to show the effect of increasing data on density and precision estimates for key receptors. It also remains unclear as to why only two cameras of data are analysed for October, November and January, yet for all other months three cameras of data are analysed. This appears to be related to when concurrent post-construction surveys were undertaken at Galloper, during which time three cameras were analysed. Could it perhaps be the case that only two cameras are sufficient when the Galloper post construction surveys weren't undertaken? Is there a requirement for the Galloper post construction surveys to have a higher survey coverage, or is it linked to a requirement to increase levels of precision for the post-construction surveys?	Analyses were carried out to provide a general indication of the changes in CVs between density and abundance estimates for a given species with data processed for 2 and 3 cameras. Additional data has been processed to provide 15% coverage (data from 3 cameras) in all monthly baseline surveys. The difference in the % coverage between months in the original dataset was, as Natural England has suggested, related to the fact that some surveys of North Falls were carried out concurrently with post construction monitoring surveys at Galloper. The initial analyses for North Falls baseline data included 15% coverage in months which coincided with post-construction surveys at Galloper to match the coverage level selected for the Galloper surveys. As noted previously, coverage for North Falls baseline surveys has now been increased to 15% for all months. It is understood that Natural England is content with this, and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)

Section (of response)	Comment	Response	Where addressed in DCO application
1.5	With regard to the advice regarding changes to the reporting in our Year 1 report comments, we welcome the commitment by NFOW that these will be accommodated in the final version, including the apportionment of unidentified species groups. We also advise NFOW give consideration to our comments on the Year 2 report.	All comments have been considered.	ES Appendix 13.2 (Document Reference: 3.3.13)

1.1.3 Natural England comments on EIA and HRA outline methodology

7. Comments attached to email from Natural England dated 26 August 2021.

Section (of response)	Comment	Response	Where addressed in DCO application
2.1	We note that the air gap is referred to as above Mean High Water Springs (MHWS), whilst the maximum rotor tip height is referred to as above Lowest Astronomical Tide (LAT). Our understanding is that for CRM the hub height should be referenced to Highest Astronomical Tide (HAT) – Band (2012) states: 'Normally, the hub height of wind turbines is measured from Highest Astronomical Tide (HAT), to help ensure navigational clearance requirements are satisfied. However, bird flight heights are measured relative to sea level, which may be 2-3 metres or more lower. Mean sea level (Z0) and HAT are normally stated relative to Chart Datum (CD). The calculation allows for a tidal offset to be added to the hub height, to allow for this additional height above mean sea level.' Natural England's understanding is that the tidal offset used in the Band (2012) spreadsheet should be the difference between Mean Sea Level (MSL) and HAT (see Band 2012). It may be the case that using HAT, MSL, MHWS etc. as the reference point does not make a difference to the predicted collision figures, provided the datum used and the height difference between this and MSL are stated in order to ensure the correct tidal offset is applied in CRM, and that all heights in the calculations are based on MSL. Therefore, clarity is required on whether a tidal offset will be used in the CRM. However, we note that it can cause considerable confusion, and potentially causes a problem when others need to use the information at a later date and are unable to work out whether a measurement relates to HAT, MSL, MHWS etc. It would be very helpful if the industry could agree a standardised method for use in all projects. Although, we note that this is not an issue that a single developer can resolve.	A tidal offset has been used in Collision Risk Modelling (CRM) for North Falls. Stochastic CRM (sCRM) has been used, as agreed with Natural England. The tidal offset is 1.93m (HAT – Mean Sea Level). CRM input parameters and results have been presented as per Natural England (2022) Best Practice Advice for Evidence and Data Standards for OWF Environmental Assessments.	ES Appendix 13.2 (Document Reference: 3.3.13)
2.1	We also note that it is stated the minimum airgap between the rotor tip and the sea surface would be 22m above MHWS. Whilst 22m is the minimum clearance of the sea surface required for navigation, an increase in air gap above 22m would reduce the risk of collisions with seabirds. Our recent advice during the Norfolk Boreas examination regarding reducing the minimum air gap is: Natural England has previously provided regulators with our advice regarding our concerns about predicted levels of cumulative collision impacts on North Sea	NFOW has committed to a 5m increase in airgap above the minimum air gap in response to stakeholder feedback. The air gap for turbines is set at 26.6m above HAT (27m above MHWS).	ES Chapter 13, Sections 13.3.2 and 13.3.3 (Document Reference: 3.1.15)

Section (of response)	Comment	Response	Where addressed in DCO application
	seabirds e.g. EIA scale great black-backed gull at East Anglia 3 and Norfolk Vanguard; Flamborough and Filey Coast SPA kittiwakes at Hornsea 2 and Norfolk Vanguard; Alde-Ore Estuary SPA lesser-black-backed gulls at Norfolk Vanguard. These concerns have intensified given the three further offshore wind farm NSIPs now submitted to PINS (Norfolk Boreas, East Anglia One North, East Anglia Two) and with further projects planned to submit in the future (Hornsea 4, Dudgeon Extension, Sheringham Extension, North Falls and Five Estuaries). Therefore, Natural England considers that without major project-level mitigation being applied to all relevant projects coming forward, there is a significant risk of large-scale impacts on seabird populations. Natural England therefore recommends that for all relevant future projects located in the North Sea, raising turbine draught height should be considered as standard mitigation practice, and that where appropriate relevant proposals should include this measure in order to minimise their contributions to the cumulative/in-combination collision totals by as much as is possible.		
2.2	The ES will need to consider all foundation options that could be considered for site and the impact assessment needs to be based on the foundation type that gives the worst case scenario for each relevant impact, e.g. for birds the foundation type that gives the worst case scenario for relevant impacts such as indirect effects from displacement of prey through increased noise and seabed disturbance during construction.	This advice has been followed.	ES Chapter 13, Section 13.3.2 (Document Reference: 3.1.15)
3.1	We advise that consideration should be given to the comments we have previously provided on the first-year survey report (dated 29th March 21) when analysing the survey data. We previously highlighted that no detailed information has been provided on how the survey design (16 transects, 2.5km apart and a minimum of 10% coverage) was arrived at. Surveys need to have been designed to collect a representative sample on bird density across the survey area. To determine whether survey coverage and design would provide an adequate baseline characterisation, we would expect that evidence from a power analysis of existing data sets be used. We note HiDef's response at the meeting on 19th July 2021 that "10% coverage is the industry standard" but we reiterate that this is not accepted by the SNCBs. If at the examination stage the percentage survey design and/or coverage are questioned by the Examining Authority, NFOW may need robust evidence as to how they came to this conclusion.	There has been detailed correspondence between Natural England and North Falls on this issue and survey coverage has been increased from 10% to 15% for all surveys. It is understood that Natural England is content with 15% coverage at North Falls and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)

Section (of response)	Comment	Response	Where addressed in DCO application
3.1	Consideration should also be given to our previous comments on the first-year survey report regarding the number of cameras data were analysed from and levels of precision. We again recommend that analysis of the full dataset (all 4 cameras) is undertaken and presented, at least for some survey months or species, to compare the levels of precision from this compared to the reduced coverage currently used, in order to assess whether this makes a significant improvement to the levels of precision. We understood from the 19th July 2021 meeting that this analysis may have been carried out on a sub-set of the data, if this is correct this should be included.	There has been correspondence with Natural England on this issue and survey coverage has been increased from 10% (images processed for two cameras) to 15% (images processed for three cameras) for all surveys. It is understood that Natural England is content with 15% coverage at North Falls and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)
3.1	We welcome confirmation that apportioning of records that can only be identified to species group; for example, 'large auk' records would be apportioned between guillemot and razorbill based on the proportions of each species recorded during a given survey.	Noted. Apportioned data has been used in the analyses for the ES.	ES Appendix 13.2 (Document Reference: 3.3.13)
3.1	For site specific potential collision height estimates, please see our comments on this in our response dated 29th March 2021, in particular Natural England's continued concern about the lack of validation for the HiDef method of estimating bird flight heights. However, we are encouraged by the comments made at the 19th July meeting that turbines and other existing infrastructure can be used as part of the process to validate the method. Our advice regarding flight heights derived from digital aerial surveys is that assessments of collision risk should present the proportions of birds at potential collision risk height (%PCH) based on both the 'generic' (i.e. Johnston et al. 2014a & b) and the site-specific data and the outputs of both Band Options 1 and 2.	For the ES, CRM has been carried out using the generic flight height data set referred to by Natural England.	ES Chapter 13, Section 13.6.2.2 (Document Reference: 3.1.15), ES Appendix 13.2 (Document Reference: 3.3.13)
4	It is important to note that for some receptors, it will not be adequate to rely only on the aerial surveys undertaken for the North Falls project, alone. These [include] red throated diver, little gull, migrating terns and potentially also migrating skuas and non-seabirds (e.g. wildfowl/waders) where there is the potential for their interaction with the site.	For red-throated diver the shadow appropriate assessment makes use of data from baseline digital aerial surveys carried out over the OTE SPA in February 2021. For the EIA, the cumulative assessment for this species makes use of SeaMAST data (Bradbury *et al*. 2014). For migratory birds (including seabirds and waterbirds) the migratory species CRM (White *et al*. 2012) is used for the RIAA.	RIAA Part 4 (Document Reference: 7.1.4) Section 4.4.1.4.4.2; and RIAA Appendix 4.1; ES Chapter 13, Section 13.6.2.1.5 (Document Reference: 3.1.15)
4.1	For non-breeding red throated diver (RTD) Natural England's advice is that a distance of potential displacement of at least 10 km is recommended when conducting site characterization and impact	Detailed consultation has been undertaken with Natural England over the methodology for the shadow appropriate assessment of red-throated diver	RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1; RIAA Appendix 4.1

Section (of response)	Comment	Response	Where addressed in DCO application
	assessments for projects within 10km of a RTD Special Protection Area (SPA). To enable a full assessment of displacement impacts of red throated diver from the Outer Thames Estuary SPA to be undertaken, Natural England will provide the applicant with the data from the 2013 and 2018 surveys of the Outer Thames Estuary commissioned by Natural England. We acknowledge that displacement will not be 100% throughout the distance over which displacement effects occur, and there will be a gradation of displacement which will decrease with distance from the windfarm. We would welcome the suggestion made by HiDef on 19th July to use a package such as MRSea to model the data. We look forward to the Applicant's progressing this element of the assessment as a priority.	displacement within the OTE SPA. The last two baseline aerial surveys of North Falls were extended to 12km from the offshore project area close to the SPA. These data and 2018 SPA survey data have been used to model the abundance of red-throated divers within a 12km buffer of North Falls where this overlaps with the SPA, in 1km increments. The appropriate assessment of displacement for red-throated diver at the OTE SPA has been carried out using these data.	(Document Reference: 7.1.4.1)
4.2	Little gull, migration terns, skuas and non-seabirds: For CRM assessments it will be more appropriate use migration modelling (SOSS-MAT or APEM migration modelling tool) or the MSS migrant approach for defining abundance/density passing through the site rather than the site-specific aerial survey data, as aerial data will be a snapshot of the time the plane flew over the site each month and turnover of birds passing through the site is likely to be unrepresented	For migratory birds (including selected seabirds and waterbirds) the migratory species CRM (White *et al*. 2012) is used for the RIAA.	ES Appendix 13.2 (Document Reference: 3.3.13); RIAA Part 4 (Document Reference: 7.1.4)
4.2	Non-seabirds: With regard to CRM of non-seabird migrants consideration should be given to whether there are any relevant SPAs that may be in the shadow of the North Falls site – there may be need to consider sites such as Hamford Water, Stour and Orwell Estuaries, Deben Estuary, Colne Estuary	All the named SPAs and a number of additional SPAs for non-seabird migrants have been considered in the HRA screening report. For the DCO submission, migratory CRM has been carried out to support the shadow appropriate assessment for any SPAs screened in for migratory bird species.	ES Appendix 13.2 (Document Reference: 3.3.13), RIAA Part 4 (Document Reference: 7.1.4)
4.2	There may also be a need to consider CRM for nightjar and woodlark migrating to breed at the Sandlings, Breckland and Minsmere-Walberswick SPAs, as the North Falls site does sit within the predicted migration zones potentially used by these species in Wright et al. (2012).	Migratory CRM has been carried out for these species for the RIAA to accompany the DCO submission.	ES Appendix 13.2 (Document Reference: 3.3.13), RIAA Part 4 (Document Reference: 7.1.4)
5.1	It is not appropriate to screen out migrant species passing through the site just based on small numbers recorded in the baseline surveys. This is due to the snap shot nature of the surveys and the likelihood that numbers are underestimated due to snap shots missing the real turnover/flux of birds through site. This will apply for little gull, migratory terns and skuas or migratory waterbirds from any SPAs in shadow of the North Falls site.	Agreed. In the HRA screening migrant species have considered based on the location of SPAs relative to North Falls. SPA qualifying species not recorded in baseline surveys have been screened in.	RIAA Appendix 1.1 HRA Screening Report (Document Reference: 7.1.1.1)

Section (of response)	Comment	Response	Where addressed in DCO application
5.1	We note it states: "…activities and/or infrastructure that could cause this impact within the array areas, and where applicable, offshore cable corridor will be presented to define the likely zone of influence". It should be noted that for displacement it is not just the array but the buffer as well.	Agreed and included in ES assessment.	ES Chapter 13, Section 13.6 (Document Reference: 3.1.15)
5.1.1	Disturbance and displacement from construction activities The construction phase presents a range of potential drivers that may cause displacement of seabirds. This includes vessel movement and construction activities (which may be both spatially and temporally limited), however the physical presence of the constructed turbines is also likely to cause a displacement response. As the construction phase progresses, more turbines are built and the spatial scale increases, until a point when the entire array is constructed, yet not operational, and may present the same displacement stimulus as an operational farm. Therefore, it should not be asserted that displacement will only occur where vessels and construction activities are present; instead we consider that displacement is likely to occur within and around the constructed array area (due to the presence of turbines) and where construction activities are ongoing. This will represent an increasing spatial impact as construction progresses. For assessment of construction phase displacement, we advise North Falls consider the pragmatic method NE advised for PEIR at Hornsea 4 of calculating operational displacement per species and reducing by 50% during the construction period (to broadly reflect reduced spatial and temporal scale) across the range of displacement mortality advised by Natural England for a particular species. We recommend this approach is taken for construction displacement assessments for red-throated diver, gannet, and auks.	This approach has been taken for the assessment of construction displacement. It is considered however that it is likely to over-estimate the magnitude of construction disturbance and displacement as, until turbines are installed on to foundations in the latter part of the construction period, there will be no tall structures above the sea surface from which birds might be displaced. Before the installation of turbines begins, construction disturbance and displacement is likely to be confined to a limited number of areas of activity within the array areas at any given time, for example in areas where piling is ongoing and turbine foundations are being installed, and array cabling is being laid	ES Chapter 13, Section 13.6.1.1 (Document Reference: 3.1.15)
5.1.1	Displacement effects from the turbine array: current NE advice for EIA is that the displacement matrices should be based on using abundance data for the site + 2km buffer for auks and gannet and for the site plus 4km buffer for red throated diver (and other divers and sea duck). Assessments should be based on: • Displacement rates of: 90-100% for red throated diver, 60-80% for gannet, and 30-70% for auks; and, • Mortality rates of 1-10% for all species.	This advice has been followed. It is considered that mortality rates of 10% are overly precautionary for displaced birds, and that displacement is likely to result at most in increased mortality of 1% or less.	ES Chapter 13, Section 13.6.2.1 (Document Reference: 3.1.15)

Section (of response)	Comment	Response	Where addressed in DCO application
	To account for uncertainty/variability of abundance, assessments should be run using the mean abundance data for the site and relevant buffer and also using the 95% confidence intervals of the abundance data as well.		
5.1.1	Displacement effects from the turbine array: for HRA assessment of red throated divers from the Outer Thames Estuary SPA assuming displacement extends only up to 4km is not appropriate where a plan or project is located within 10km of a red throated diver SPA. An update to the 2017 SNCB displacement note, to reflect this advice, is in preparation. In the meantime, we advise that the extent of the displacement for red throated diver is assumed to be 12km, and an approach similar to the one that NE advised for EA1N/EA2 should be undertaken for the North Falls assessment. The recommended approach to mitigating and assessing displacement effects on red throated diver at EA1N/EA2 is outlined in NE's Deadline 1 response at EA1N/EA2 examination, and we recommend that a similar modelling approach is undertaken for North Falls. As promised in the recent ETG call on 19th July 21, Natural England will make the data available from the 2013 and 2018 Outer Thames Estuary Surveys.	Detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the OTE SPA. The last two baseline aerial surveys of North Falls were extended to 12km from the offshore project area in areas close to the SPA. These data plus the 2018 SPA survey data (Irwin *et al*., 2019) have been used to model the abundance of red-throated divers within a 12km buffer of North Falls where this overlaps with the SPA, in 1km increments. The shadow appropriate assessment of displacement for red-throated diver at the OTE SPA has been carried out using these data. For the EIA, displacement of red-throated divers has been assessed for the array areas and a 4km buffer, as advised by Natural England.	RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1; RIAA Appendix 4.1 (Document Reference: 7.1.4.1); ES Chapter 13, Sections 13.6.2.1.5 and 13.7.3.1.4 (Document Reference: 3.1.15)
5.1.1	We note it is stated: 'It is likely that the Natural England online tool (Searle et al. 2019) will be used for PVA'. Whilst we welcome this, we advise that the NE PVA tool is used to determine the predicted population level effects over the operational lifetime of the offshore wind farm, where the predicted mortality from an impact would increase the receptor population mortality rate by 1% or more. However, it should be noted that for red throated diver from the Outer Thames Estuary SPA, impacts on mortality will not be the main issue, but the other factors such the reduction in available habitat, and changes in distribution of the interest feature will be more important.	Noted. As well as predicted population level effects the shadow appropriate assessment for red-throated diver at the OTE SPA considers the distribution of the species within the SPA.	RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1
5.1.1	We agree that migratory species would be likely to encounter the turbine array only once during a given migration journey if North Falls is situated within their flight corridor, meaning they could potentially encounter the site and hence any barrier effect up to twice per year. We agree that the energetic costs of such one-off avoidance events can be considered to be negligible for the North Falls project alone. However, we recommend that the impact of cumulative barrier effects on migratory species is not scoped out of the assessment at this stage.	An assessment of the potential cumulative barrier effect of OWFs on migratory bird species has been undertaken.	ES Chapter 13, Section 13.7.3.4 (Document Reference: 3.1.15)

Section (of response)	Comment	Response	Where addressed in DCO application
5.1.1	Displacement and disturbance from operation and maintenance activities If this includes operation and maintenance vessel movements, it will be necessary to consider the port where these vessels will come from and whether they will need to pass through any designated sites (e.g. Outer Thames Estuary SPA or possibly the Greater Wash SPA) to reach the site and if they will or may do, then there will be a need to assess impacts from this for these sites. Once the port has been identified, it may be necessary to consider best practice protocols to minimise any impacts. from vessel movements. The EA1N/EA2 'Deadline 7 Submission - EA1N Best Practice Protocol for Minimising Disturbance to Red Throated Diver - Version 02' sets out the measures required. Please also see our response to the protocol.[1]	A protocol for vessel movements in relation to red-throated divers has been included as embedded mitigation.	ES Chapter 13, Section 13.3.3 (Document Reference: 3.1.15); Outline Project Environmental Management Plan (Document Reference: 7.6)
5.1.2	We note that the estimated collision risk using Collision Risk Modelling (CRM) will be undertaken using either the deterministic approach (Band 2012) or the more recently developed stochastic approach (MacGregor et al. 2018). The SNCBs are in the process of updating our advice in relation to collision risk modelling and this will be available shortly. Once this is available, we will share this with North Falls. Avoidance rates should be based on the recommended rates in the recent review of avoidance rates by the BTO (Cook, 2021) This paper was published on 20 August 2021.	Based on advice from Natural England the sCRM has been used. It is noted that Cook (2021) has been withdrawn and avoidance rates for PEIR were based on SNCBs (2014) guidance. Interim advice from Natural England on updated avoidance rates and additional parameters for some species has been incorporated for the ES supporting the DCO examination.	ES Chapter 13, Section 13.6.2.2 (Document Reference: 3.1.15), ES Appendix 13.2 (Document Reference: 3.3.13)
5.1.2	We welcome the intention is to calculate collision risk using the generic data set for flight height (Johnston et al. 2014a and b), and present site-specific flight height data alongside the generic data set. For migratory birds the densities should not come from the digital aerial baseline data as it is a snapshot, so the numbers of birds passing through the site should be generated using migration modelling (e.g. APEM tool or SOSS-MAT, or MSS WWT (2014) approach, where appropriate for the species).	For the ES, CRM has been carried out with reference to the generic flight height data set referred to by Natural England. Site specific flight height data is not included. The migratory CRM (Wright *et al*. 2012) has been used for migratory species in the RIAA which accompanies the DCO submission.	ES Chapter 13, Section 13.6.2.2 (Document Reference: 3.1.15) ; Appendix 13.2 (Document Reference: 3.3.13)

[1] East Anglia ONE North Offshore Wind Farm Appendix A12 to the Natural England's Deadline 4 Submission Natural England advice on Red-Throated Divers in the Outer Thames Estuary Special Protected Area related to Deadline 3 submissions

Section (of response)	Comment	Response	Where addressed in DCO application
5.1.2	With regard to consented vs as-built layouts for use in cumulative collision risk assessments, we note that Natural England's advice is that the consented figures should be used. Please see the advice provided on the East Anglia 1 North and East Anglia 2 applications.	The consented figures have been used for OWFs in English waters, as advised by Natural England, in the cumulative and in combination assessments. Reference is also made to the likely scale of reduction in cumulative effects if as-built collision risk estimates for English OWFs were used instead of consented estimates. For OWFs in Scottish waters, it is understood that the situation is different and that Marine Directorate and NatureScot accept the use of as built designs in cumulative and in combination assessments. Therefore, the in combination totals for North Falls include as built predictions of collision risk for Scottish OWFs, where available.	ES Chapter 13, Section 13.6.2.2 (Document Reference: 3.1.15) ; RIAA Part 4 (Document Reference: 7.1.4)
7.1	We welcome that the foraging ranges in Woodward et al. (2019) will be used to inform breeding season connectivity and screening. Our current advice regarding screening colonies for LSE during the breeding season is to use the representative mean maximum foraging ranges presented in Woodward et al. (2019) + 1 SD for each relevant species. In some situations, it may be justified to consider screening in colonies beyond the published mean maximum foraging range + 1SD of the qualifying features. For example, behavioural data from development sites such as offshore wind farms might indicate connectivity to a colony within maximum, but not mean maximum, foraging range. Therefore, we recommend that a two-step process is applied to screening: 1. Woodward et al. (2019) mean maximum foraging ranges + 1 SD for each relevant species; and then, 2. Cross checking against colony specific foraging ranges to ensure no relevant colonies are missed from being screened in.	This approach has been applied to HRA screening where colony-specific data on foraging range are available. It is noted that colony-specific data, usually from GPS tracking studies, often indicate smaller foraging ranges than the mean maximum +1SD from Woodward *et al*. (2019). Colony-specific foraging range data, where available, has been referred to in the RIAA.	RIAA Appendix 1.1 HRA Screening Report (Document Reference: 7.1.1.1); RIAA Part 4 (Document Reference: 7.1.4)
7.1	Assessments should always be based upon the best and most up to date evidence available. New tracking data not included in the review by Woodward *et al*. (2019) may suggest that previous foraging ranges for a species were underestimated; so, it may be appropriate to derive new maximum and mean maximum ranges.	Where available, tracking data which post-dates the Woodward *et al*. (2019) review has been referenced for the RIAA which accompanies the DCO submission.	RIAA Part 4 (Document Reference: 7.1.4)
7.1	For sites and species where adverse effect on integrity cannot be ruled out, any additional impacts from North Falls should be considered, specifically red throated diver at Outer Thames Estuary SPA, kittiwake	It Is assumed this means for sites and species where AEoI cannot be ruled out based on in combination effects of existing operational and consented OWFs,	RIAA Part 4 (Document Reference: 7.1.4)

Section (of response)	Comment	Response	Where addressed in DCO application
	at Flamborough & Filey Coast SPA, and Lesser black-backed gull at Alde Ore Estuary SPA.	noting that a number of OWFs in the UK North Sea have recently been consented subject to compensation for kittiwakes and guillemots at FFC SPA and black-headed gull at Alde-Ore Estuary SPA, and one OWF for red-throated diver at the OTE. This approach has been taken in the in combination assessments for the relevant SPAs.	
7.1	For migratory waterbird species, it states screening will consider qualifying features of coastal, wetland and marine SPAs and Ramsar sites within 100km of North Falls. Again, we do not think this is appropriate–- if there is a potential impact pathway through birds potentially passing through the site on migration, then these species should be screened in irrespective of whether the relevant SPA they are a feature of is more than 100km from North Falls.	Contrary to the comment here, in comments on a draft of the HRA Screening report Natural England has indicated that the 100km approach is acceptable. (see the HRA Screening Report, Appendix 1.1). This approach (using the 100km zone of influence) has been followed with a cross-check to the migratory corridors for species identified in Wright *et al*. (2012), as advised by Natural England.	RIAA Appendix 1.1 HRA Screening Report (Document Reference: 7.1.1.1)
7.2.1	As noted in our recent advice on the North Falls year 1 aerial bird surveys report (dated 29th March), the proposed North Falls site is located approximately 2-3km from the Outer Thames Estuary SPA. Therefore, we re-iterate our significant concerns that given the proximity of the site to the Outer Thames Estuary SPA, displacement effects on red-throated diver will likely result in a long-term reduction in the availability of diver habitat in part of the SPA, and a change of the distribution of divers within the SPA. In turn, this is likely to result in an adverse effect on site integrity (aEoI), both alone and in-combination with other plans and projects. We again advise that North Falls give this immediate consideration and we recommend they follow the advice we have recently provided during the East Anglia One North examination. The assessment should be based on displacement effects on red throated diver extending to 12km. We acknowledge that the survey data includes a buffer of 4km and using the 2013 and 2018 digital aerial survey data. Further detail in set out NE's Deadline 1 response at EA1N/EA2 examination (see link above).	The revised boundary of the North Falls array is 4.5km from the OTE at the nearest point. Detailed consultation has been undertaken with Natural England over the methodology for the shadow appropriate assessment of red-throated diver displacement within the OTE SPA. The last two baseline aerial surveys of North Falls (January and February 2021) were extended to 12km from the offshore project area in areas close to the SPA. These data plus data from the 2018 SPA survey have been used to model the abundance of red-throated divers within a 12km buffer of North Falls where this overlaps with the SPA, in 1km increments. The appropriate assessment of displacement for the OTE SPA has been carried out using these data.	RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.1.3; RIAA Appendix 4.1 (Document Reference: 7.1.4.1)
7.2.2	As noted in our recent advice on the North Falls year 1 aerial bird surveys report (dated 29th March), the proposed North Falls site is located within the mean-maximum foraging range of lesser black-backed gull (Woodward et al. 2019) of the Alde-Ore Estuary SPA. Therefore, there is the potential that birds recorded within the proposal site during the breeding season will be breeding birds from this colony.	It is recognised that some recent consents for OWFs in the UK southern North Sea have been on the basis of derogation and compensation measures for lesser black-backed gull at the Alde-Ore Estuary, indicating the Regulators' view that the magnitude of current in combination effects from OWFs (collision risk)	RIAA Part 4 (Document Reference: 7.1.4) Section 9.3.3.1; HRA Derogation Provision of Evidence (Document Reference: 7.2)

Section (of response)	Comment	Response	Where addressed in DCO application
	Birds from the colony may also interact with the proposal outside the breeding season (e.g. on migration). During the recent Norfolk Vanguard, Norfolk Boreas, East Anglia One North and East Anglia Two offshore wind farm examinations, we have advised that an aEoI cannot be ruled out in respect of lesser black-backed gull at Alde-Ore Estuary SPA in-combination with other plans and projects. Therefore, any additional mortality arising from this proposal would be considered adverse.	represents an AEoI. A review of options for compensatory measures for lesser black-backed gulls at the Alde Ore Estuary SPA was included with the PEIR. Evidence to support an HRA derogation case is provided with the DCO application.	
7.2.3	As noted in our recent advice on the North Falls year 1 aerial bird surveys report (dated 29th March), whilst the proposed North Falls site may be located outside of foraging range of kittiwakes breeding at the Flamborough and Filey Coast (FFC) SPA, there is the potential for birds from this site to interact with the proposal outside of the breeding season (e.g. on migration). We highlight that the in-combination total of collision mortality across consented plans/projects has already exceeded levels which are considered to be of an aEoI to kittiwake at FFC SPA, and that any additional mortality arising from the proposal would therefore be considered adverse.	It is recognised that some recent consents for OWFs in the UK southern North Sea have been on the basis of derogation and compensation measures for kittiwakes at the FFC SPA, indicating the view of Regulators' that the magnitude of current in combination effects from OWFs (collision risk) represents an aEoI. A review of options for compensatory measures for kittiwakes at the FFC SPA was included with the PEIR. Evidence to support an HRA derogation case, including compensation proposals for kittiwake compensation is provided with the DCO application.	RIAA Part 4 (Document Reference: 7.1.4) Section 9.4.3.1; HRA Derogation Provision of Evidence (Document Reference: 7.2)
7.3	We welcome that it is accepted that there is likely to be a requirement for North Falls to prepare an in-principal compensation case. However, it should be noted that Natural England is not aware of any feasible compensatory measures for displaced red throated diver at Outer Thames Estuary SPA. We therefore strongly advise that assessment is carried out to determine the full extent of displacement, and mitigation measures such as increasing the buffer between the North Falls and the OTE SPA boundary.	It Is noted that EA1N has been consented subject to an exclusion zone of 8km from the SPA boundary and compensatory measures for red-throated diver at the OTE. A review of options for compensatory measures for red-throated diver was included with the PEIR. Evidence to support an HRA derogation case, including RTD compensation proposals is provided with the DCO application.	RIAA Part 4 (Document Reference: 7.1.4); HRA Derogation Provision of Evidence (Document Reference: 7.2)
7.3	As noted in our advice to North Falls dated 29th March, we again note that in the Secretary of State's (SoS) decision letter for Vanguard, the SoS stated: 'that it is important that potential AEoI of designated sites are identified during the pre-application period and full consideration is given to the need for derogation of the Habitat Regulations during the Examination. He expects Applicants and statutory nature conservation bodies ("SNCBs") to engage constructively during the pre-application period and provide all necessary evidence on these matters, including possible compensatory measures, for consideration during the Examination.' Therefore, based on the points above regarding aEoI for	The Applicant has made significant embedded mitigation commitments described in ES Chapter 13, Section 13.3.3 and RIAA Part 4 (Document Reference: 7.1.4). In addition, Evidence to support an HRA derogation case is provided with the DCO application. Consultation with the ornithology ETG has been undertaken throughout the pre-application process and has informed the development of mitigation and compensation proposals.	ES Chapter 13, Section 13.3.3 (Document Reference: 3.1.15); RIAA Part 4 (Document Reference: 7.1.4); HRA Derogation Provision of Evidence (Document Reference: 7.2)

Section (of response)	Comment	Response	Where addressed in DCO application
	the Outer Thames Estuary, FFC and Alde-Ore Estuary SPAs, we again strongly recommend that North Falls give consideration to this and to development of mitigation and in principle compensation measures for these three SPAs before submission of their application to the Planning Inspectorate.		

1.1.4 Natural England comments on Scoping Report

8. Letter from Natural England dated 16 August 2021 (reference 14432/360449).

Section (of response)	Comment	Response	Where addressed in DCO application
Page 2	Natural England is particularly concerned by the close proximity of the North Falls proposal (2.5km) to the Outer Thames Estuary (OTE) Special Protection Area (SPA), which creates the potential for an Adverse Effect on Integrity (aEoI) on the OTE SPA from the Project alone and also in-combination. The extent of the potential displacement on red throated diver, using a methodology agreed with Natural England, needs to be carried out as soon as possible to enable a full assessment of the impact on all the OTE's conservation objectives. This should be presented in the Environmental Statement/information to inform the Habitats Regulations Assessment. We strongly advise that this is done before the Application is submitted, to allow for any mitigation measures to be incorporated in the array design. In relation to the HRA impacts on OTE SPA, Natural England anticipate the need for significant mitigation, given the close proximity of North Falls to the boundary of the OTE SPA. Should displacement effects on the SPA not be reduced to a level where there is no contribution to in combination effects, the Applicant will need to present a derogations case and bring forward compensatory measures.	Post-PEIR the boundary of North Falls has been revised and the western boundary of the array area has been moved further away from the OTE SPA, to approximately 4.5km at the nearest point. Detailed consultation has been undertaken with Natural England over the methodology for the shadow appropriate assessment of red-throated diver displacement within the OTE SPA. An HRA derogation case with compensatory measures is included with the DCO application.	RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1; RIAA Appendix 4.1; HRA Derogation Provision of Evidence (Document Reference: 7.2)
Pages 18 and 22	We agree with the statement that 'consultation is a key element of the EIA process and consultation with technical consultees will be crucial to the development of the assessments.' Whilst the Scoping Report states that 'The detailed methodologies for data collection and undertaking the impact assessments will be agreed with the relevant stakeholders', we note that Natural England were consulted on the survey design for the offshore ornithology digital aerial surveys and We were also consulted on the year 1 surveys, however, at a time when the second year of surveys were nearly complete. Furthermore, since our original comments in 2019 our understanding on several issues has further developed. As a result, we have raised some queries and concerns to North Falls regarding whether survey coverage and design would provide an adequate baseline characterisation. We recommend that North Falls consider our comments raised regarding the survey design and undertake the additional analysis we suggested in our advice on the year 1 survey report in order to provide robust evidence that the surveys provide an adequate baseline characterisation.	There has been detailed correspondence between Natural England and NFOW on this comment. Additional data has been processed to provide 15% coverage in all monthly baseline surveys. It is understood that Natural England is content with 15% coverage at North Falls and this issue is considered to be agreed.	ES Appendix 13.2 (Document Reference: 3.3.13)

Section (of response)	Comment	Response	Where addressed in DCO application
Page 18	As stated at the first offshore ornithology expert topic group (ETG) on 19th July a key element of providing an adequate baseline characterisation will be assessing impacts on the Outer Thames Estuary SPA, which will require assessing displacement beyond the 4km of the survey buffer.	In January and February 2021, the Digital Aerial survey area was extended to 12km from the OWF boundary in the west (ES Figure 13.2 (Volume 3.2) (Document Reference: 3.2.9)), to include additional areas for red-throated diver. This was in anticipation of a request from Natural England to consider displacement beyond 4km from North Falls.	ES Chapter 13, Section 13.4.2.1 (Document Reference: 3.1.15); ES Appendix 13.2 (Document Reference: 3.3.13); RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1
Page 18	With regard to mitigation, in relation to the HRA impacts on OTE SPA, Natural England anticipate the need for significant mitigation, given the close proximity of North Falls to the boundary of the Outer Thames Estuary SPA. We strongly advise that North Falls undertakes a detailed assessment of the full extent of potential impacts of red throated diver displacement on OTE SPA and consider appropriate mitigation before submitting an application.	Detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the OTE SPA. The Applicant has made significant embedded mitigation commitments for red-throated divers in response to stakeholder consultation, including a reduction in the array area and associated infrastructure to increase the distance from the OTE and commitment to a shipping protocol described in the Outline Project Environmental Management Plan (Document Reference: 7.6). In addition, Evidence to support an HRA derogation case is provided with the DCO application.	ES Chapter 13, Section 13.3.3 (Document Reference: 3.1.15); RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1; HRA Derogation Provision of Evidence (Document Reference: 7.2)
Page 19	We note that the Scoping Report states that 'Projects which are sufficiently implemented during the site characterisation for North Falls will be considered as part of the baseline for the EIA'. We agree that as North Falls baseline characterisation surveys didn't start until 2020, any displacement effects from offshore wind farms operating at that time would be picked up in North Falls' survey data, if the effects from the other wind farms cover the North Falls survey area. However, Natural England does not agree that these wind farms should be considered part of the baseline. This is because, although some of the operational wind farms that would be included in the cumulative assessments have been operational for over 10 years, the bird population data that will be used in the impact assessments pre-date the installations. For example, the data used in Furness 2015 to inform the red-throated Biologically Defined Minimum Population Scales (BDMPS) comes from a variety of sources including O'Brien et al. 2008, which draws on aerial survey data from 2001-06 and	The advice of Natural England has been followed. Specifically in relation to red-throated diver, the cumulative assessment (ES Section 13.7) and in combination appropriate assessments (RIAA Part 4 Section 4.5.2 (Document Reference: 7.1.4)), for this species considers all other OWFs which may cause displacement of this species within the area of search, including developments which were operational prior to the baseline surveys for North Falls.	ES Chapter 13, Section 13.7.3.1.4 (Document Reference: 3.1.15); RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1

Section (of response)	Comment	Response	Where addressed in DCO application
	Wetland Bird Survey and county bird records from 1995-2005). Therefore, the baseline cannot be assumed to include the effects of these wind farms. The rationale for including many of the windfarms built within the OTE SPA in the assessment, and not considering them as part of the baseline is set out in Appendix A12 and A14 of Natural England's Deadline 4 Submission during the East Anglia One North/East Anglia Two examinations.		
Page 20	The Scoping Report also states that 'Where possible NFOW will seek to agree with stakeholders the use of as-built project parameter information (if available) as opposed to consented parameters to reduce over-precaution in the cumulative assessment.' … Natural England's advice is that the consented figures should be used, unless the as- built scenario is legally secured. However, our view is that there is currently no agreed mechanism for this. We recommend that for the offshore ornithology assessments the consented collision predictions should be used for projects included within the cumulative/in combination collision assessments. We recommend North Falls consider our advice regarding as built vs consented scenarios provided during the recent Norfolk Boreas examination and on Non-Material Changes (NMCs) during the East Anglia One North/East Anglia Two examinations.	This applies to cumulative and in combination collision risk, where for a number of OWFs the as-built scenario has a lower collision risk than the consented scenario (for example because fewer larger turbines have been used compared with the worst-case consented scenario). The consented figures have been used for OWFs in English waters, as advised by Natural England in the cumulative and in combination assessments. The likely percentage reduction in cumulative / in combination collision risk based on as-built collision risk estimates is also referred to, to illustrate the difference between as-built and consented scenarios. For OWFs in Scottish waters, it is understood that the situation is different and that Marine Directorate and NatureScot accept the use of as built designs in cumulative and in combination assessments. Therefore, the in combination totals for North Falls include as built predictions of collision risk for Scottish OWFs.	ES Chapter 13, Section 13.7 (Document Reference: 3.1.15); RIAA Part 4 (Document Reference: 7.1.4)
Page 21	It is stated that the array areas are a minimum of 2.5km from the from the OTE SPA at the closest point. Natural England are concerned that given the proximity of the array to the OTE SPA, displacement effects on red-throated diver will result in a long-lasting reduction in the availability of diver habitat in part of the SPA and a change of the distribution of divers within the SPA. In turn, this would result in an AEoI, both alone and in-combination with other plans and projects. Given the level of concern regarding displacement impacts for the Project alone and in-combination for this feature of this SPA, we strongly advise that North Falls assess the full extent of the potential displacement effects on all the site's Conservation Objectives and based on Natural England's advice on assessment to East Anglia One North/East Anglia Two as soon as possible. This work can inform a mitigation strategy	Post-PEIR the boundary of North Falls has been revised and the western boundary of the array area has been moved further away from the OTE SPA, to approximately 4.5km at the nearest point. The Applicant has made significant embedded mitigation commitments described in ES Chapter 13, Section 13.3.3 and RIAA Part 4, Section 9.2.3.1. In addition, Evidence to support an HRA derogation case is provided with the DCO application.	ES Chapter 13, Section 13.3.3 (Document Reference: 3.1.15); RIAA Part 4 (Document Reference: 7.1.4) Section 9.2.3.1; HRA Derogation Provision of Evidence (Document Reference: 7.2)

Section (of response)	Comment	Response	Where addressed in DCO application
	based on the removal of some planned turbines to increase the buffer between the proposed array and the SPA boundary. Given that it is likely that any additional impacts arising from the North Falls proposal would be considered adverse, we note that in the Secretary of State's (SoS) decision letter for Vanguard, the SoS stated: 'that it is important that potential AEoI of designated sites are identified during the pre-application period and full consideration is given to the need for derogation of the Habitat Regulations during the Examination. He expects Applicants and statutory nature conservation bodies ("SNCBs") to engage constructively during the pre-application period and provide all necessary evidence on these matters, including possible compensatory measures, for consideration during the Examination.'	Consultation with the ornithology ETG has been undertaken throughout the pre-application process and has informed the development of mitigation and compensation proposals.	
Page 21	It is stated that the array areas are located within the mean-maximum foraging range of lesser black-backed gull (Woodward et al. 2019) of the Alde-Ore Estuary SPA. Therefore, there is the potential that birds recorded within the proposal site during the breeding season will be breeding birds from this colony. Birds from the colony may also interact with the proposal outside the breeding season (e.g. on migration). During the recent Norfolk Vanguard, Norfolk Boreas, East Anglia One North and East Anglia Two offshore wind farm examinations, we have advised that an AEoI cannot be ruled out in respect of lesser black-backed gull at Alde-Ore Estuary SPA in combination with other plans and projects. Therefore, any additional mortality arising from this proposal would be considered adverse. Given the level of concern regarding in-combination collision mortality for this feature of this SPA, as noted above, we strongly advise that North Falls consider at an early stage raising the draught height of their turbines by as much as possible in order to minimise their contribution to the cumulative/in-combination collision totals by as much as is possible and to include this as embedded mitigation within the ES. We would also recommend that North Falls provide evidence/justification (e.g. engineering or technological constraints) for the draught heights they arrive at. Given that it is likely that any additional mortality arising from the North Falls proposal would be considered adverse, we note that in the Secretary of State's (SoS) decision letter for Vanguard, the SoS stated: 'that it is important that potential AEoI of designated sites are identified during the pre-application period and full consideration is given to the need for derogation of the Habitat Regulations during the Examination. He expects Applicants and statutory nature conservation bodies ("SNCBs") to engage constructively during the pre-application period and provide all necessary evidence on these matters,	The minimum air gap for turbines is set at 26.6m above HAT which is a 5m increase from that proposed at Scoping stage. Evidence to support an HRA derogation case is provided with the DCO application. The derogation case includes an assessment of alternative solutions to reduce effects on the national site network, such as alternative air gap. The derogation case also includes compensatory measures for lesser black-backed gull at the Alde-Ore Estuary SPA.	ES Chapter 13, Section 13.3.2 (Document Reference: 3.1.15); HRA Derogation Provision of Evidence (Document Reference: 7.2)

Section (of response)	Comment	Response	Where addressed in DCO application
	including possible compensatory measures, for consideration during the Examination.' Therefore, based on the above regarding AEoI for Alde-Ore Estuary SPA, we strongly recommend that North Falls give consideration to this and to development of in principle compensation measures for this SPA before submission of their application to the Planning Inspectorate.		
Page 22	Whilst the proposed array areas may be located outside of foraging range of kittiwakes breeding at the Flamborough and Filey Coast (FFC) SPA, there is the potential for birds from this site to interact with the proposal outside of the breeding season (e.g. on migration). We highlight that the in-combination total of collision mortality across consented plans/projects has already exceeded levels which are considered to be of an AEoI to kittiwake at FFC SPA, and that any additional mortality arising from the proposal would therefore be considered adverse. Given the level of concern regarding in-combination collision mortality for this feature of this SPA, as noted above, we strongly advise that North Falls consider at an early stage raising the draught height of their turbines by as much as possible in order to minimise their contribution to the cumulative/in-combination collision totals by as much as is possible, and to include this as embedded mitigation in the ES. We would also recommend that North Falls provide evidence/justification (e.g. engineering or technological constraints) for the draught heights they arrive at. Given that any additional mortality arising from the North Falls proposal would be considered adverse, we note that in the Secretary of State's (SoS) decision letter for Vanguard, the SoS stated: 'that it is important that potential AEoI of designated sites are identified during the pre-application period and full consideration is given to the need for derogation of the Habitat Regulations during the Examination. He expects Applicants and statutory nature conservation bodies ("SNCBs") to engage constructively during the pre-application period and provide all necessary evidence on these matters, including possible compensatory measures, for consideration during the Examination.' Therefore, based on the above regarding AEoI for Flamborough and Filey Coast SPA, we strongly recommend that North Falls give consideration to this and to development of in principle compensation measures for this SPA before submission of their application to the Planning Inspectorate.	As above, the minimum air gap for turbines is set at 26.6m above HAT. Discussions on in principle compensation measures for kittiwake at FFC SPA have been held as part of the EPP. Evidence to support an HRA derogation case is provided with the DCO application.	RIAA Part 4 (Document Reference: 7.1.4); Habitats Regulations Derogation: provision of Evidence (Document Reference: 7.2); Compensation Documents are provided for: Lesser black-backed gull (Document Reference; 7.2.2); Red-throated diver (without prejudice) (Document Reference: 7.2.3): Kittiwake (without prejudice) (Document Reference: 7.2.4): and Guillemot and razorbill (without prejudice) (Document Reference: 7.2.5).
Page 23	For HRA assessment of red throated divers from the Outer Thames Estuary SPA, Natural England advises that assuming displacement extends only up to 4km is not appropriate where a plan or project is located within 10km of a	Through the EPP, detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-	RIAA Part 4 (Document Reference: 7.1.4), Appendix 4.1 (Document Reference:

Section (of response)	Comment	Response	Where addressed in DCO application
	red throated diver SPA. An update to the 2017 SNCB displacement note, to reflect this updated advice, is in preparation. In the meantime, we advise that the extent of the displacement for red throated diver is assumed to be 12km, based on post consent monitoring at London Array As there will not be baseline survey data extending out to 10km or more for red-throated diver, we advise that North Falls follow the advice we have recently provided during the East Anglia One North/East Anglia Two examinations. The recommended approach to mitigating and assessing displacement effects on red throated diver at East Anglia One North/East Anglia Two is outlined in our Deadline 1 response during the examination for these projects (Natural England 2020). We recommend that a similar modelling approach is undertaken for North Falls.	throated diver displacement within the OTE SPA. The last two baseline aerial surveys of North Falls were extended to 12km from the offshore project area in areas close to the SPA. These data have been used to model the abundance of red-throated divers within a 12km buffer of North Falls where this overlaps with the SPA, in 1km increments. Thus the shadow appropriate assessment of displacement in relation to the OTE SPA has been carried out to 12km from North Falls. For the EIA, displacement of red-throated divers has been assessed for the array areas and a 4km buffer, as advised by Natural England.	7.1.4.1), ES Chapter 13 (Document Reference: 3.1.15).
Page 24	Other data sources that could be considered for informing the EIA and HRA include: • Marine Ecosystems Research Programme (MERP) • Seabird Mapping and Sensitivity Tool (SeaMaST) • Tracking data, e.g. RSPB tracking data of kittiwakes from the FFC SPA, Alde-Ore Estuary lesser black-backed gull tracking data (e.g. Thaxter et al. 2014). There is also more recent tracking data from post construction monitoring at Galloper Offshore Wind Farm. With regard to relevant documents from marine licence applications for other offshore wind farms in the North Sea and Channel, of particular relevance to North Falls will be Natural England's advice regarding: • red throated diver at the Outer Thames Estuary SPA at East Anglia One North/East Anglia Two; • FFC SPA kittiwakes, Alde-Ore Estuary SPA lesser black-backed gulls at Norfolk Vanguard, Norfolk Boreas, East Anglia One North/East Anglia Two; • Cumulative impacts for gannet, kittiwake, great black-backed gull, guillemot and razorbill at Norfolk Vanguard, Norfolk Boreas, East Anglia One North/East Anglia Two. Consideration of our recent advice should be given in respect of the EIA's alone and cumulative/in-combination assessments for the North Falls project.	Data and information sources noted and have been used as appropriate and referenced in the text.	ES Chapter 13 (Document Reference: 3.1.15); RIAA Part 4 (Document Reference: 7.1.4).

Section (of response)	Comment	Response	Where addressed in DCO application
Page 24	It should be noted that an update to the 2017 SNCB displacement note, to reflect updated advice regarding red throated diver, is in preparation. We will share the updated displacement advice with North Falls as soon as it is available. In the meantime, we advise that the extent of the displacement for red throated diver is assumed to be 12km, and an approach similar to that NE advised for East Anglia One North/East Anglia Two should be undertaken for the assessment.	Through the EPP, Detailed consultation has been undertaken with Natural England over the methodology for assessing displacement of red-throated diver. As above, for the shadow appropriate assessment, red-throated diver displacement has been assessed to 12km within the OTE SPA. This 12km buffer has been divided into 1km increments, and the assessment takes account of predicted decreases in displacement with increasing distance from the Array area boundary.	RIAA Part 4 (Document Reference: 7.1.4); RIAA Appendix 4.1 (Document Reference: 7.1.4.1)
Page 25	The SNCBs are also in the process of updating our advice in relation to collision risk modelling and this will be available shortly. Once the updated SNCB advice in relation to collision risk modelling is available, we will share this with North Falls so that the EIA can be based on the latest advice.	CRM has been carried out based on the latest available advice from SNCBs, including the Natural England (2022) Best Practice Advice for Evidence and Data Standards, Phase 3.3 and consultation with Natural England, and supplementary advice provided by Natural England in 2023.	ES Chapter 13, Section 13.2.2.2 (Document Reference: 3.1.15) ; ES Appendix 13.2 (Document Reference: 3.3.13)
Page 25	We welcome that the potential impacts during construction will cover displacement and disturbance of birds due to construction activities and vessel movements and indirect impacts on birds through changes in prey or habitat availability. The assessment of construction indirect impacts should consider impacts via underwater noise and generation of suspended sediments through activities such as piling and seabed preparation for installation of foundations. Indirect impacts on habitats and prey should also consider such impacts resulting from cable laying activities. Disturbance and displacement from construction lighting should also be considered.	This advice has been followed.	ES Chapter 13 (Document Reference: 3.1.15)
Page 25	The potential operational impacts that will be covered are collision risk, displacement and barrier effects from presence of turbines; disturbance and displacement associated with operation and maintenance activity including vessel movement; and indirect impacts on prey and habitats. Consideration could also be given to direct habitat loss from the turbine locations (not in terms of the whole offshore wind farm footprint); although it is acknowledged that this is likely to be small.	Information is provided on the extent of direct habitat loss, which represents 3.55% of the total array area. This scale of habitat loss is not considered to represent a likely significant effect on offshore ornithology receptors and has been scoped out of the ES.	ES Chapter 13 (Document Reference: 3.1.15)
Page 25	We agree that operational collision risk and displacement/barrier effects should be assessed. We recommend that consideration is also given to cumulative construction impacts. Consideration should be given to the	These likely significant effects are considered in the Scoping Report for cumulative effects.	ES Chapter 13 (Document Reference: 3.1.15)

Section (of response)	Comment	Response	Where addressed in DCO application
	potential for cumulative construction impacts from North Falls and Five Estuaries, if both projects were to be in construction at the same time. Additionally, consideration should be given to potential cumulative impacts from construction of North Falls with operational impacts from the existing operational wind farms of Galloper and Greater Gabbard.		
Page 25	We note that whilst there is the possibility of bird collision with vessels during construction and decommissioning, this is likely to be minor, with the main impact from collision being with the operational turbines. So, we agree that collision during construction/decommissioning has been scoped out.	Agreed	N/A
Page 26	The information provided on the approach to assessment is very brief and high level. No real detail is provided on the approaches that will be taken for the various assessments, other than that collision risk will be undertaken using generic flight height data and site-specific data. There is no information on the collision risk model that will be used, or the approach to be used for displacement assessments (e.g. using the matrix approach) etc. We would recommend that further information on the specific methodologies to be adopted for assessment of each potential impact is provided during the Evidence Plan process. As stated, the most critical of this is agreeing the methods for assessing red throated diver displacement as soon as possible. We anticipate discussing this level of detail during the Evidence Plan Process for the Project and note that this has begun with the first Offshore Ornithology Expert Topic Group Meeting held on 19th July where the initial method statement approach was discussed.	Further detailed consultation has been undertaken through the EPP and correspondence with Natural England. Use of the sCRM and avoidance rates has been agreed. Operational displacement assessments have used the matrix approach (UK SNCBs 2017) with the proportion of birds displaced and the proportion of displaced birds that die based on advice from Natural England Detailed consultation has been undertaken with Natural England over the methodology for assessing displacement of red-throated diver.	ES Chapter 13, Sections 13.6.2.2.2 (Document Reference: 3.1.15); ES Appendix 13.2 (Document Reference: 3.3.13); RIAA Part 4 (Document Reference: 7.1.4); RIAA Appendix 4.1 (Document Reference: 7.1.4.1).

1.1.5 Natural England comments on North Falls third ETG, presentation and minutes

9. Letter from Natural England dated 19 April 2023, reference DAS/14432/424248.

Section (of Natural England letter)	Comment	Response	Where addressed in DCO application
Summary, page 1	Natural England advises that North Falls OWF's conclusions regarding adverse effects [for red-throated diver at the Outer Thames estuary SPA] depart significantly from the precedents set by the Secretary of State's HRA and consent decision for the East Anglia 1N and East Anglia 2 OWFs. We continue to advise that the evidence base strongly suggests that the project alone will exert a displacement effect on red-throated divers (RTD) within the Outer Thames Estuary Special Protection Area (OTE SPA), resulting in effective habitat loss and impacting RTD distribution in the site, and hindering the conservation objectives for the SPA. Furthermore, we disagree that an in-combination effect can be excluded and believe that North Falls will contribute to the in-combination impact on the SPA.	While it is accepted that North Falls will exert a displacement effect on RTD in the OTE SPA, this effect will be very small, and the Project will not affect any areas of the SPA not already subject to potential displacement from other OWFs and shipping traffic. The Applicant's position is that any effect of North Falls will not be material in terms of the conservation objectives and a Project alone effect can be ruled out. It is acknowledged that there is an existing in combination effect of displacement to red-throated divers from OWFs within or near to the SPA. However, the position of the Applicant is that North Falls does not make a material contribution to the in combination effect.	RIAA Part 4 (Document Reference: 7.1.4), Section 4.4.1.4.4.
1.	"*In summary, can't do quantitative assessment of numbers of RTDs predicted to be displaced and displacement mortality, as no estimate for all OWF for 12km (survey data only went out to 4km previously). However, estimates suggest no decline in SPA population. Based on estimates since classification in 2010, 180% increase in population numbers – at the same time as a number of OWFs have become operational inside and within 12km of SPA boundary*." With regard to the last sentence (in bold above), we advise that, as stated during the ETG presentation, there has also been a change in survey method from Visual Aerial Survey (VAS) to Digital Aerial Survey (DAS) which will also lead to greater population estimates.	The advice is noted. It is not clear whether methodology changes alone, from visual to digital aerial surveys, account for the increase in the red-throated diver population of the OTE SPA between the population cited on the SPA citation (1989-2007) and the estimates from surveys in 2013 and 2018, whether there has been a real increase in the red-throated diver population over this period, or a combination of both.	RIAA Part 4 (Document Reference: 7.1.4)
1.2	"*The next outstanding action is for NE to confirm if Burbo Bank RTD displacement information is available. However, RHDHV now has that report. It is also understood it has been used for the NE displacement gradient. This is now a discharged action*."	The advice from Natural England is noted. An updated version of the Natural England displacement gradient for red-throated diver was subsequently received and used for the RIAA.	RIAA Part 4 (Document Reference: 7.1.4), Section 4.4.1.4.4.

Section (of Natural England letter)	Comment	Response	Where addressed in DCO application
	The text in bold was an error on our part, for which we apologise. Natural England looked at the Burbo Bank data but could not easily derive a displacement gradient from it, so it is not used in the proposed gradient calculation. The gradient was calculated by taking the maximum displacement in 1km bins from previously calculated displacement gradients and then applying a linear trend line. Note that the trend line has only been used to derive displacement rates outside the array. Within the array a precautionary 100% rate has been applied. The data used to inform the gradient is from Gunfleet Sands, Kentish Flats, Lincs, Lynn & Inner Dowsing, London Array and a gradient calculated by Raul Vilela for NE from the German Bight data in Vilela et al (2020).		
1.3	Natural England Action: To Provide Clarification on the Extent of Displacement Effects to be Assessed for North Falls and the Outer Thames Estuary (OTE) Special Protection Area (SPA), 10km or 12km. … given the proximity of London Array OWF to the proposed North Falls site, and the potential for North Falls to cause further deterioration of conditions in areas affected by London Array OWF, Natural England consider it appropriate to consider a 12km buffer for consideration of displacement effects.	This advice has been followed in the RIAA.	RIAA Part 4 (Document Reference: 7.1.4), Section 4.4.
2.1.1	Whilst we recognize the potential value of quantifying the 'gradient effect' of displacement with increasing distance from OWF, Natural England consider the calculation of an Effective Displacement Area (EDA) to be fundamentally flawed and misleading, especially when the area of habitat over which displacement is occurring is of principal importance. The proportion of the population that is displaced is in no way analogous to the area that birds are subject to displacement from. The logical supposition if the area of 'effective' displacement is 55% would be that the remaining 45% of the area is not subject to displacement effects. This is clearly not the case. The displaced proportion of the population cannot use any of the area, i.e., displacement is occurring over the full extent of the area. Birds that are not displaced are likely (but not necessarily) dispersed over the entire area. Therefore, there is no logical way to proportionally	It is agreed that on its own EDA is potentially misleading. However, as Natural England acknowledge, given that studies indicate that red-throated diver displacement from OWFs decreases with distance, it is arguable also that presenting only the area of the SPA subject to some extent of displacement over-estimates the extent of displacement and effective habitat loss. Presenting EDA alongside the total area of an SPA subject to some form of displacement therefore gives some context to the total displacement area. It is noted that EDA is one of the parameters referenced in the appropriate assessment for red-throated diver and the OTE SPA for EA1N (BEIS 2022). Also, that in their advice on the North Falls Outline Method	RIAA Part 4 (Document Reference: 7.1.4), Section 4.4

Section (of Natural England letter)	Comment	Response	Where addressed in DCO application
	reduce the area of effective habitat loss by the scale of impact on the population. Natural England therefore cannot agree with the proposed approach. The key metrics on which Natural England will base our advice are the extent over which displacement effects will take place (expressed as km2 and % of SPA) and also the number of individuals subject to displacement, as the latter gives context to the extent values and provides at least some sense of the 'gradient effect'.	Statement for red-throated diver (letter dated 12 July 2022, ref. AS/14432/392882), Natural England requested that the extent of effective displacement should be presented for North Falls.	
2.1.2	While it is accepted that there is overlap between the North Falls buffer with shipping routes and other OWFs which may be exerting displacement effects (over a buffer zone) on RTD, it must be noted that there are still RTD present in these areas. It is these birds that are being assessed as at risk of displacement from this project. Their apparent tolerance of the already impacted status of the habitat in question is not evidence that a further impact could be tolerated; indeed it seems entirely plausible that additional pressures will drive a further deterioration of habitat availability in these areas and displace further individuals. There is no basis on which to conclude that the project will not additionally impact the availability of habitat and the distribution of RTD within the SPA.	North Falls agrees with the statement by Natural England that there will be RTDs present in areas of overlap between the North Falls 12km buffer and the OTE SPA, which also overlap with the 12km buffers of other OWFs and shipping lanes; and that these birds are potentially subject to additional effects of displacement from North Falls. However, it is still considered appropriate to consider the extent of additional displacement / deterioration of perceived habitat quality that might be predicted in relation to North Falls, particularly given the presence of international shipping lanes between the boundary of the Turbine Array and the SPA.	RIAA Part 4 (Document Reference: 7.1.4), Section 4.4
2.1.3	Natural England agree that there is a lack of data from other OWFs in terms of density and abundance of RTDs out to 12km as baseline surveys for other projects did not extend to 12km. However, Natural England do not agree that a quantitative in-combination assessment of mortality is not possible. Two alternative approaches are suggested for consideration. Natural England would be pleased to help scope out the most robust approach to an in-combination mortality assessment through the ETG process.	North Falls has investigated both approaches suggested by Natural England for a quantitative in combination assessment of RTD displacement at the OTE SPA (see responses below).	RIAA Part 4 (Document Reference: 7.1.4)
2.1.3 (i)	Calculate an in-combination total from the numbers of birds predicted to be displaced from the original Ess of each OWF or use the numbers calculated to be displaced as presented in post-construction monitoring reports. These existing figures are likely to be underestimates due to the reduced spatial extent over which the	This option was investigated in consultation with Natural England but is not recommended as an approach and has not been taken forward.	RIAA Part 4 (Document Reference: 7.1.4)

Section (of Natural England letter)	Comment	Response	Where addressed in DCO application
	figures are derived. Accordingly, contribution to the in-combination total predicted to occur from NFOWF when considering a 12km buffer might appear disproportionately large.		
2.1.3 (ii)	Determine the post-construction density of RTD in each 1km buffer out to 12km around each OWF using the 2013 or 2018 SPA wide RTD density datasets. Then, 'back calculate' a pre-construction density by applying the appropriate percentage reduction to the current density in that buffer. E.g., 10 birds/km^2 in a buffer where the gradient indicates a 50% reduction in density suggests a pre-construction density of 20 birds/km^2. Repeat this for each buffer around an OWF and total the absolute differences in RTD numbers across all 12km buffers. Some preliminary testing would be required to ascertain if reasonable estimates can be achieved in this way. It may also be difficult to account for overlapping buffers.	This option has been taken forward and is presented in the RIAA.	RIAA Part 4 (Document Reference: 7.1.4), Section 4.4.1.4.4
2.1.4	Natural England's position is that existing displacement pressures within the site mean that adverse effects on integrity are arising on RTD using the OTE SPA. Natural England therefore considers any additional displacement would add to the in-combination impact. It is stated that a total area of 149.4 km^2 (representing 3.8% of the SPA) may be subject to displacement impacts when considering a 12km buffer for North Falls OWF. This buffer distance is considered appropriate as it is informed by evidence from the nearby London Array OWF. Natural England advises that the evidence base strongly suggests that the project alone will exert a displacement effect on red-throated divers in the Outer Thames Estuary SPA, which will inevitably impact the availability of supporting habitat and the distribution of RTD in the site, which has the potential to undermine the relevant conservation objectives. Further, Natural England consider that the North Falls project will therefore contribute to the in-combination impact at the SPA. Natural England strongly suggest that the East Anglia 1N and East Anglia 2 HRAs and SoS decisions are reviewed, and that all options for avoiding, mitigating and compensating the impacts on RTD at OTE SPA are fully considered. Natural England would welcome	Natural England's position is understood, and the offer of collaboration is welcomed. North Falls has also reviewed the HRAs for EA1N and TWO (BEIS 2022a, b) and the position of the SoS. It is considered that the situation with North Falls is somewhat different to EA1N and EA2, as the areas of overlap between the 12km buffers of these sites and the OTE SPA are not in close proximity to designated shipping lanes and other OWFs, as is the case for North Falls, As noted above, it is still considered valid to consider the extent of additional displacement that might be caused by North Falls Array, given other sources of disturbance to RTDs in this area and their relative location in relation to North Falls. Without prejudice compensation measures for RTD are presented alongside the RIAA.	RIAA Part 4 (Document Reference: 7.1.4); Habitats Regulations Derogation: Provision of Evidence (Document Reference: 7.2); Red-throated diver Compensation Document (without prejudice) (Document Reference: 7.2.3).

Section (of Natural England letter)	Comment	Response	Where addressed in DCO application
	further engagement and the opportunity to input collaboratively on this difficult issue.		
2.2	Lesser Black-backed Gull Draft RIAA, Alde-Ore Estuary SPA, Operational Collision Risk. We welcome your conclusions regarding the SPA and look forward to the North Falls OWF without prejudice compensation plans for lesser-black backed gull.	Natural England's comment is noted. In principle compensation measures have been developed in consultation as part of the EPP.	Habitats Regulations Derogation: Provision of Evidence (Document Reference: 7.2); Lesser black-backed gull Compensation Document (Document Reference: 7.2.2).
2.3	Kittiwake Draft RIAA, Flamborough and Filey Coast SPA, Operational Collision Risk. We welcome your conclusions regarding the SPA and look forward to the North Falls OWF without prejudice compensation plans for kittiwake.	Natural England's comment is noted. In principle compensation measures have been developed in consultation as part of the EPP.	Habitats Regulations Derogation: Provision of Evidence (Document Reference: 7.2); Kittiwake Compensation Document (without prejudice) (Document Reference: 7.2.4).

1.1.6 Natural England Comments on PEIR

10. Letter from Natural England dated 14 July 2023, responding to Statutory Consultation under Section 42 of the Planning Act 2008 and Regulation 13 of Infrastructure Planning (Environmental Impact Assessment) Regulations 2017).

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
3 (Ch13, Table 13.2, 13.3, App 13.1 (pp36-37)	Natural England welcomes the commitment to an increased air gap above the minimum standard. We note that the airgap for all design scenarios is stated as 27m above MHWS (26.6m above HAT) and that this air gap increase of 5m over that required for navigational purposes is proposed as embedded mitigation to reduce collision risk. In relation to the consultation response included on pg. 36-37 of Appendix 13.1, Natural England notes, with respect to increasing the air gap further, it is suggested that that installation vessel options for larger turbines are limited, and compensatory measures for lesser-black backed gull will be proposed to support a Habitats Regulations Assessment (HRA) derogation case. Natural England highlights that increasing the rotor clearance further would give greater reductions in collision risk estimates generated by the project. We do not consider it appropriate to suggest that compensatory measures are considered at an early stage of project design when the full extent of all mitigation options are not fully explored. We remind the Applicant that compensating for impacts should only be considered as a last resort and that it will be necessary to demonstrate no satisfactory alternatives should adverse effects be identified. We also draw the Applicant's attention to the significant difficulties encountered to date by projects seeking to compensate for ornithological impacts, including for lesser black-backed gull. This gives further weight to the requirement to exhaust the mitigation hierarchy.	Following PEIR, refinements to the project design envelope have been made in accordance with the mitigation hierarchy, described in ES Chapter 13 (Document Reference: 3.1.15), Section 13.3.3 and RIAA Part 4 (Document Reference: 7.1.4). Evidence to support an HRA derogation case is provided with the DCO application. The derogation case includes an assessment of alternative solutions to reduce effects on the national site network, such as alternative air gap. The derogation case also includes compensatory measures for lesser black-backed gull at the Alde-Ore Estuary SPA.	Habitats Regulation Derogation: Provision of Evidence (Document Reference: 7.2).
4 (App 13.2, Section 2.1)	Natural England notes that species identifications are given confidence levels of definite, possible, or probable. All such records are treated as positively identified. No identification (ID) rates appear to be reported. Thus, it is not clear what ID rates were achieved, how this varied seasonally, and therefore if	These data are provided in ES Appendix 13.2 (Document Reference: 3.3.13).	ES Appendix 13.2, (Document Reference: 3.3.13)

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
	apportioning unidentified auks to species according to the ratio of identified birds in each survey is appropriate. Please present proportions of data assigned to all categories (i.e., possible, probable, and definite) as well as to generic groupings (large auk sp., etc). Natural England requests that this is undertaken for each species for all surveys to facilitate full review of the variability of ID rates. Natural England is particularly interested in gaining a more complete understanding of the underlying data used to calculate abundance estimates for auks.		
5 (App 13.2, Table 3)	Natural England notes the relatively consistent survey timings and short duration of surveys. Although unsurprising, it is also of interest that surveys were only undertaken in sea states 5 or below, given a common criticism of boat-based methods being restricted to those conditions was that this would bias the data. It would be useful to understand the variation in survey duration. The shortest survey being 2:35 hours and the longest 4:15. As it is not reported otherwise and no month has multiple surveys, we assume all surveys achieved 100% coverage of transects. Detail the level of coverage achieved for each survey, i.e., number of transects completed, with % completed detailed for each transect.	The variation in survey duration is largely due to the plane transits for prepositioning prior to the survey. The level of coverage per survey is detailed in ES Appendix 13.2.	ES Appendix 13.2, Table 2.9 (Document Reference: 3.3.13)
6. (App 13,2, Table 6	We note either the monthly totals or the total number of red-throated diver reported in the extended survey area for Year 2 appear to be incorrect (245 total reported from 37+195). Please QA these data and confirm the total.	Total amended (to 232).	ES Appendix 13.2, Table 2.9 (Document Reference: 3.3.13)
7 (App. 13.2 Section 2.1 & Ch 13 Para 16)	Natural England notes that the extended 12km buffer was only surveyed during 2 of the 24 surveys, during the second winter period and in response to updated SNCB advice. While we accept that the updated Statutory Nature Conservation Body (SNCB) advice on buffers for survey of red-throated divers in the vicinity of SPAs designated for that species was published during the survey program, we highlight that best practice dictates that a minimum of two years of baseline data should be gathered. In-lieu of this data it may be necessary for the submitted Environmental Statement (ES) to	The RTD data from the extended survey area are not used for the ES, where RTD displacement effects are considered to 4km from the array area only, as advised by Natural England, and two years of baseline data are available for this area. Data from the extended buffer are used in the RIAA, where two years of data were also available for the area being assessed (overlap between the 12km buffer of North Falls and the OTE SPA), from the Project baseline surveys in 2021, and the SPA surveys in 2018.	RIAA Part 4 (Document Reference: 7.1.4)

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
	apply more precaution in any assessment of the extended buffer area as interannual variation cannot be accounted for.		
8 (App 13.2, Table 21 & Table 78-82)	Natural England is not sure of the methods used to generate confidence intervals (CIs) and standard deviations (SDs) for the monthly flight densities used in Collision Risk Modelling (CRM). However, for the displacement analysis it appears that monthly statistics have been calculated by taking a mean of the mean population and a mean of the upper confidence interval (UCI) and lower confidence interval (LCI). We do not believe this method generates appropriate CIs The submitted ES should clearly describe how SDs & CIs were estimated for total populations, densities, apportioned behaviours and corrected apportioned behaviours. Natural England suggests consideration of the following approach for deriving mean abundance and density estimates, and their associated SDs and CIs when bootstrapping is used. Apportioning (unidentified birds or behaviours) and application of correction factors (e.g. availability corrections) should be applied to bootstrap sample estimates for each survey. The resultant overall abundance distributions from the samples should be used to derive the means, SDs and CIs. If a mean, SD and CIs are required based on two or more surveys (e.g. from two peak abundance estimates within a season or two densities of birds in flight in a calendar month), the relevant corrected bootstrap samples should be pooled to provide a single sample from which to draw the estimates.	The Natural England suggested approach to deriving mean abundance and density estimates has been followed for the ES.	ES Appendix 13.2, (Document Reference: 3.3.13)
9 (App 13.2, Tables 84-96)	We welcome the use of white highlighted cells to indicate displacement and mortality rates used in the project alone displacement assessment. We consider it would be useful if the tables in the submitted ES also indicated where >1% increase in baseline mortality is predicted (if visible on the matrix), e.g. by red highlighting.	This has been done: in displacement matrices, mortality values which represent >1% increase in population mortality are in red text.	Displacement assessments in ES Chapter 13 Section 13.6 (Document Reference: 3.1.15) and RIAA Part 4 (Document Reference: 7.1.4) Section 4.4.
10 (Ch13, Table 13.13)	It is unclear where the productivity figure for little gull originates as this is not included in Horswill & Robinson (2015).	Little gull demographic data has been deleted from the table, as this species is not scoped in for assessment.	N/A

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
	The submitted ES should clarify the source or justify the use of these little gull survival rate, productivity, and average mortality values.		
11 (Ch 13, Para 101)	Natural England considers there is insufficient evidence to categorically state that there have been no changes in population size during spring migration in the German North Sea over the period 2001-2021 since there have been changes to survey platform, and presumably detection rates, during that period. Furthermore, Leemans & Collier (2022) point out that "*the main construction period of offshore wind farms in the German Bight started in 2012 and the most relevant wind farms (closest to the core area of the birds) became operational in 2014/2015. Population level effects may thus not yet have been visible*". What is clear is that there is a body of evidence consistently showing that diver distribution has shifted to avoid OWFs. This is significant when considering the OTE SPA conservation objective target to "*Maintain the extent, distribution and availability of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding)*." Natural England urges caution in interpreting population estimates showing apparently stable or even increasing populations in regions where wintering red-throated divers have been subject to displacement impacts. The population estimates used are frequently incomparable due to differences in survey methodology, with modern digital aerial survey (DAS) methods having higher detection rates than boat-based or visual aerial survey (VAS) methods. Please also refer to our comments below on the Report to Inform Appropriate Assessment (RIAA).	In relation to the German North Sea, Vilela *et al*. (2022), reports fluctuations but no trend in RTD population size in spring between 2001-2021, which includes a seven-year period since OWFs became operational in 2014/15. If the observed displacement from OWFs in this area were to affect the survival of adult birds using this area during the non-breeding season it might be expected that population level effects would have manifested in this seven-year period. Vilela *et al*. (2022) suggest that in this area, the carrying capacity of the available habitat has not been reached. Tracking data from tagged red-throated divers show large home ranges (several thousand square kilometres) during the non-breeding season (Kleinschmidt *et al*. 2022, Nehls *et al*. 2017)) such that displacement effects of OWFs will only affect a part of the home range of an individual bird. The effects of displacement on RTDs, if any, may be via body condition and perhaps breeding success. Villela *et al*. (2022) and earlier studies in the same area (Vilela *et al*, 2021, 2020), use data from visual aerial and digital aerial surveys. It is reported that it was possible to incorporate differences in detection rate between techniques in the statistical analysis. Ship survey data were not included in the analysis as density estimates were considered to have large uncertainties and they were not considered comparable with aerial survey data. In relation to the OTE SPA, it is considered that the change in population estimates between SPA classification in 2010 (6,466 individuals) and 2018 (18,079 individuals) has been interpreted with caution based on the change from visual to digital aerial surveys. No assumptions have been made about any increasing population trend in this area. Nevertheless, the scale of the increase in estimated population size (180%) is such that it would seem highly unlikely that there has been a decrease in the numbers of RTDs present during the non-breeding season.	ES Chapter 13 Section 13.6.2.1.2 (Document Reference: 3.1.15); RIAA Part 4 (Document Reference: 7.1.4)

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
12 (Ch 13, paras 101, 102, 107)	A >1% increase in baseline mortality is calculated for the worst-case scenario (10% mortality). The adoption of a "precautionary evidence-based 1% mortality" rate is suggested, under which the increase in baseline mortality is <1%. Natural England does not believe the characterisation of a 1% mortality rate as 'evidence-based' is defensible. Empirical evidence regarding the consequences of displacement for seabirds and wintering waterbirds using the marine environment remains very limited. Furthermore, the role of overwinter survival on seabird population dynamics is poorly understood. While accepting that a 10% mortality rate is likely to be precautionary, we highlight it is intended to be, and that the mortality rates also represent a crude method of capturing a range of potentially deleterious direct, in-direct and carry-over effects that could conceivably arise from displacement. Where increases to baseline mortality of <1% are identified in the range of displacement and mortality impacts recommended for assessment by SNCBs it may be necessary to investigate this impact further, e.g., by population viability analysis (PVA) modelling. Natural England suggest further discussion on this issue with respect to red-throated diver in future ETGs.	The likely range of mortality for displaced red-throated divers is discussed further in the ES Chapter 13 (Document Reference: 3.1.15) and RIAA Part 4 (Document Reference: 7.1.4), in the context of the recent JNCC red-throated diver energetics study (Thompson *et al.*, 2023) and the Natural England review of that study. A range of mortality of 1-10% for displaced birds is presented, although it is still considered that 1% is an appropriate precautionary estimate, and that expert opinion based on available evidence suggests that red-throated divers are able to accommodate any additional energetic costs of displacement during the non-breeding season.	ES Chapter 13, Section 13.6.2.1.2 (Document Reference: 3.1.15) RIAA Part 4 (Document Reference: 7.1.4).
13 (Ch 13, para 184)	This section relates to razorbill so references to guillemot are presumed to be erroneous. QA the text for copy/paste errors in the submitted ES.	Q/A has been undertaken for submitted ES.	N/A
14 (Ch.13 Tables 13.17, 13.19, 13.21, 13.22, 13.24, 13.27, 13.29, 13.31, 13.45, 13.47, 13.49, RIAA Tables 7.17, 7.18, 7.20, 7.21, 7.23, 7.24, 7.26, 7.27)	We welcome the use of highlighted cells to indicate displacement and mortality rates used in the project alone displacement assessment. We consider it would be useful if the submitted ES tables also indicated where 1% of baseline mortality was exceeded (if visible on the matrix).	This has been done for the ES and RIAA: in displacement matrices mortality values which represent >1% increase in population mortality are in red text.	Displacement assessments in ES (Document Reference: 3.1.15) and RIAA Part 4 (Document Reference: 7.1.4) (Section 4.5.2)

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
15 (Ch 13, para 260)	It is stated that there is a <1% increase in the mortality rate of the corresponding reference population of lesser black-backed gull, with the exception of the upper confidence limits associated with scenarios 1b (72 turbines of 250m rotor diameter, 0.25 and 0.5 nocturnal activity) during the breeding season. We note however that scenario 1a also shows a >1% increase in predicted mortality rate in UCI for NAF at 0.25 and 0.50 during the breeding season for the reference population. Please amend if necessary following updated Collision Risk Modelling (CRM).	CRM results tables have been updated.	ES Chapter 13, Table 13-39 (Document Reference: 3.1.15)
16 (Ch 13, paras 207, 211, 214, 217, 219, 226)	It is stated by the Applicant that; "At North Falls, the largest numbers of red-throated divers were recorded during the spring migration period (Table 13.16), at which time there is likely to be a turnover of individuals passing through the area, rather than a resident population. Thus, a given individual might only be displaced once from the wind farm, as opposed to being displaced multiple times if it was resident over the three-month spring migration period". There are other references to turnover of birds during migration periods and a suggestion that displacement effects are therefore less likely to incur adverse consequences. Natural England does not agree with this assertion. On the contrary, if birds are relying on the area as a short-term migratory staging area, impacts could be felt more acutely. Energetically depleted birds may be less able to compete for resources or find alternative habitat. It may be harder for these individuals to increase foraging rates to account for being displaced into potentially sub-optimal habitat. Migration could be delayed or even aborted (with consequences for breeding success) if sufficient resources are not obtained to continue the journey. Indeed, there may be insufficient alternative habitat and we highlight our concerns that red-throated diver may already be subject to an AEoI in-combination in relation to extent, distribution and availability of habitat arising from disturbance and displacement impacts in the OTE SPA. Natural England also questions the value of variable survey results in similar time periods as evidence of turnover. Red-throated divers are known to spend a significant amount of time underwater, but availability bias is not accounted for. Furthermore, foraging may be focused on specific time periods,	The comments from Natural England on the importance of wintering / staging areas whether they are short- or long-term resources for migratory birds are acknowledged. Data from tracking studies indicates that red-throated divers wintering in the southern North Sea are linked to breeding populations in Fennoscandia (as well as Greenland and northern Russia). Fennoscandian birds migrate from their breeding grounds in autumn, spending time in the Baltic Sea and the southern North Sea during the non-breeding season. For divers captured and tagged in the German Bight during winter (n=33), staging stops during spring migration varied from approximately 3 – 13 days in duration for birds travelling to different breeding locations (although sample sizes were generally small and confidence limits were wide). While Individuals from the same breeding areas largely followed the same routes, birds dispersed to different areas during the non-breeding period, so the non-breeding season home ranges only partially overlapped. A subsample of birds (n=9) followed for 2 years showed generally high site fidelity during spring staging (Kleinschmidt *et al*. 2022). While there is currently no availability bias estimate for RTD, the availability biases for other diving bird species can be used to give some indication of whether changes in diving behaviour might account for changes in RTD numbers between different surveys. Based on available data on diving behaviour, HiDef scales up abundance estimates of guillemots, razorbill and puffins sitting on the water by respective factors of 1.2375, 1.174 and 1.1416. Surveys of the OTE SPA on 4 and 17 February 2022 produced estimates of 10,148 and 22,280	Text relating to migratory turnover has been amended in ES Chapter 13 Section 13.6.2.1.3 (Document Reference: 3.1.15).

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
	e.g., associated with the tidal cycle. Such confounding factors, in addition to other factors influencing detection rates, would need to be fully considered to understand the underlying reasons for the quoted disparities in survey estimates. If this assertion is to appear in the submitted ES, it would be necessary to provide evidence of red-throated diver turnover to substantiate the claim that displacement of individuals is more temporally limited than the season of assessment.	individual RTDs within the SPA boundary (Irwin *et al*. 2019). If it were to be assumed that all RTDs recorded on 4 February were sitting on the water (availability bias is applied only to birds recorded on the water, not birds in flight), and the highest availability bias for auks were to be applied (1.2375 for guillemot), then this would increase the abundance estimate to 12,558, which is still much lower than the estimate for 17 February (without any consideration of availability bias in relation to the latter survey).	
17 (Ch 13, para 216)	This section relates to additional mortality of red-throated divers during the spring migration period. References to the 'autumn BDMPS' are therefore assumed to be a copy/paste error. QA and amend this in the submitted ES. Natural England suggests following the convention as presented in the relevant Biologically Defined Minimum Population scales (BDMPS) tables for clarity, which simply define spring and autumn as 'migration seasons' due to the population being consistent across both time periods.	QA and update in submitted ES. While the Natural England advice is noted, it is considered appropriate to distinguish spring and autumn migration seasons, for clarity in the assessment.	ES Chapter 13 Section 13.6.2.1.3 (Document Reference: 3.1.15)
18 (Ch 13, para 230)	Natural England notes that CRMs are to be updated for Environmental Impact Assessments (EIA) and Habitats Regulations Assessments (HRA) to reflect the latest guidance on avoidance rates and other parameters. Natural England will refrain from commenting on the results of CRM conducted to date in the knowledge that these will be superseded.	Noted. Revised CRM results and assessments are presented in the ES.	
19 (Ch 13, Table 13.42)	Natural England maintains that it may be necessary to consider the cumulative impact of construction with Five Estuaries as well as existing operational impacts from Galloper Offshore Wind Farm (GWF) and Greater Gabbard Offshore Wind Farm (GGOW). While displacement impacts may already be occurring, this does not preclude an increase in this impact. i.e., birds that have not been displaced yet may be displaced due to new activity. Natural England would welcome discussion on the approach to cumulative effects assessment (CEA) of construction impacts at future ETG meetings.	As there is potential for construction works at North Falls and Five Estuaries Offshore Wind Farm to be ongoing simultaneously, and the offshore cable corridors are aligned, the cumulative effect of construction within the ECC cable corridor is assessed. It is considered that the presence of, and existing operational activities associated with Galloper and Greater Gabbard OWFs are reflected in the baseline density and abundance estimates for North Falls, so to apply additional operational effects from these OWFs to the North Falls baseline would effectively be to double-count their impacts.	ES Chapter 13, Section 13.7.3.1 (Document Reference: 3.1.15)

Comment no. (PEIR section)	Comment	Response	Where addressed in DCO application
	We advise consideration of options to reduce concurrent construction impacts, e.g., by aligning vessel routes used with Five Estuaries OWF.		
20 (Ch13, para 287; Tables 13.44, 13.46, 13.48, 13.50 – 13.56, App 13.3)	Natural England does not agree with the approach to project screening. The exclusion of displacement causing activities from the CEA on the grounds that they do not have large scale permanent infrastructure does not consider the fact that aggregate extraction and busy commercial shipping lanes can lead to long-term displacement of birds. The submitted ES should consider other displacement-generating projects (including relevant aggregate extraction) projects in the CEA.	North Falls is of the view that there is a distinction to be made between permanent infrastructure above the sea surface, within OWF turbine arrays, and aggregate extraction areas where disturbance would take place only when extraction is ongoing and would be spatially limited to areas in the vicinity of extraction vessel(s). Aggregate extraction is an ongoing activity considered to be part of the baseline conditions when the Project surveys were undertaken. Similarly commercial shipping lanes are considered to be part of the baseline conditions. Including these activities in a cumulative or in combination assessment would be considered to be effectively double-counting their impacts.	ES Section 13.7.2 (Document Reference: 3.1.15)
21 (Ch 13, para 287; Tables 13.44, 13.46, 13.48, 13.50-13.56; App 13.3	The cumulative and in-combination assessments for gannet, great black-backed gull, kittiwake, and lesser black-backed gull, do not show data from a number of other projects (for kittiwake, for example, predicted collisions have been zeroed for Dudgeon, Gunfleet Sands, Lynn and Inner Dowsing, Scroby Sands, and Sheringham Shoal). This is either because the predicted mortality was zero or an estimate was not provided in the ES for a given OWF. However, it is not clear whether it is the former or the latter. Please differentiate between impacts where data exists but the impact is predicted to be zero and where impacts have not been calculated. Natural England recommends updating the figures used for CEA and in-combination assessment once they have been agreed upon in the Sheringham Shoal and Dudgeon Extensions (SEP & DEP) examination, which is currently ongoing.	Based on checks back to some of the original ES documents for the OWFs referred to, it is not always clear (from documents held by RHDHV and available from internet searches) whether predicted collision mortality was zero or an estimate was not provided in the ES (for example for 'early' OWFs, collision risk modelling results may be presented only for a few species in the ES, with no information on whether CRM was run for other species). Therefore, it can be difficult to distinguish between these two scenarios. For the ES the final CEA figures for SEP and DEP are referred to in this regard, to assume that where '-' is included there is no estimate for a given OWF, and where '0' is included, the collision risk was zero.	ES Appendix 13.3 (Document Reference: 3.3.14)

1.1.7 Natural England comments on the draft RIAA produced to accompany the PEIR

11. Letter from Natural England dated 14 July 2023, responding to Statutory Consultation under Section 42 of the Planning Act 2008 and Regulation 13 of Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

12. This feedback is detailed in the RIAA Part 4 Offshore Ornithology (Document Reference: 7.1.4)

1.1.8 Natural England comments on red-throated diver in combination assessment memo and In principle compensation options technical note

13. Letter from Natural England dated 15 December 2023, reference DAS/27843/456775.

14. This feedback is detailed in the RIAA Part 4 Offshore Ornithology (Document Reference: 7.1.4)

RSPB

15. Prior to the PEIR, feedback received from the RSPB related to the HRA and therefore comments and responses are reflected in the HRA Screening Report (Document Reference: 7.1.1.1) and the Compensation Consultation Annex 1A (Document Reference: 7.2.1.1) to the HRA Derogation Provision of Evidence.

1.1.9 RSPB Comments on PEIR

PEIR section / issue	Comment	Response	Where addressed in DCO application
General	Due to staff constraints the RSPB has not fully reviewed the full PEIR documentation, but we present our high-level comments below. However, we have concerns about the potential impacts on a number of species including, red throated diver, gannet, kittiwake, lesser black-backed gull, guillemot and razorbill.	RSPB concerns are noted.	N/A
Appendix 13.2 Site Characterisation	The RSPB welcome the Digital Aerial Survey work carried out by HiDef on behalf on the Applicant, and the details provided in the Offshore Ornithology Technical Report, Appendix 13.2. For the presentation of this information for the full assessment, we would recommend that the Applicant considers the recent NatureScot report on Digital Aerial Surveys, an output of work from its' Scientific Advisory Board, which includes recommendations on how best to present such work and necessary statistical consideration.	The report from NatureScot was published in January 2023 and includes 17 recommendations regarding Digital Aerial Survey. The NatureScot report postdates the North Falls surveys by some years. Although the final version of the two year report was published after the NatureScot report, the two year report was mostly written before the NatureScot DAS recommendations were known. The majority of the NatureScot recommendations are included in the standard HiDef approach to survey and reporting but a few are not. Hidef does not supply a statistical analysis plan (SAP) as part of the survey submission. All analyses undertaken on the data collected during the survey is detailed in the reports and the steps in data processing also recorded. Spatial autocorrelation is an acknowledged issue with transect surveys and HiDef employ techniques and recommendations from Buckland *et al* (2001). The data analysis section of the report includes data treatment and derivation of population and density estimates. Hidef also includes details of treatment of availability bias for birds and marine mammals. Whilst consideration of power to detect changes has been incorporated in HiDef survey design project specific power analysis is only undertaken in certain circumstances. At present Hidef does not include details of	N/A

PEIR section / issue	Comment	Response	Where addressed in DCO application
		the lack of behavioural changes observed due to expected lack of disturbance but quote studies where this has been determined previously.	
Appendix 13.2 Site Characterisation	We welcome the presentation of the survey timings and note that very few surveys ended later than 1400, and so a full account should be given of any potential biases in the results that may arise from this.	Practical limitations mean that surveys are usually conducted during the 'middle' period of the day, especially; nocturnal flying, available daylight hours for working times and minimising glare. Like most birds, seabird activity varies throughout the day and so there will be an impact on proportion of birds in flight (generally lower at night and around twilight) and even the number of birds offshore away from the colony in the breeding season as birds may return to the colony, or vicinity of the colony at night and so fewer breeding adults may be expected to be present offshore at the ends of the day. Such a pattern varies by species and also with an annual cycle, by breeding stage or status and with short-term fluctuations in prey availability or wind speed and direction. For some species at certain times of year the density pattern at sea may be very different, for example common guillemot in winter may attend their colony on land during the day and spend the night at sea. Surveys are designed to characterise the seabird use of an area of sea, although variation in that use is explicitly acknowledged, along with sampling error, in uncertainty estimates provided with the bird density values. It is acknowledged that some additional variation may not be sampled due to surveys not taking place near to dawn or dusk, but the typical densities of birds at sea are expected to be sampled by this procedure. In order to investigate this potential bias further it may be possible to use analysis of tagged birds to describe distribution and activity by time of day. This is outside the scope of an individual offshore wind project. An example of such a study is Thaxter *et al*., 2022 which investigated tracking data from five seabird species: gannet, lesser black-backed gull, kittiwake, guillemot and razorbill. During the breeding season it was concluded that the constraints associated with aerial surveys are unlikely to mean that data are biased.	N/A

PEIR section / issue	Comment	Response	Where addressed in DCO application
Appendix 13.2 Site Characterisation	There is evidence that the neap/spring tidal cycle can influence that at sea distribution of birds. As such, the RSPB would welcome consideration of this in the presentation of the survey timings and a discussion of how this may affect the resultant site characterisation	Tidal data have been extracted via the UK Tide Gauge Network (2024) for the closest site to the OWF area (Harwich) for the relevant dates. Data for tide heights are provided at fifteen-minute intervals and were joined to the observations data based on the median time of each survey, rounded to the closest fifteen-minute interval. Tide height is plotted against apportioned density estimates (without availability bias corrections) in ES Appendix 13.2 (Document Reference: 3.3.13), Figure 13.2.5. Spearman's rank correlation coefficient and associated p value are provided for each species, limiting the data to species present in more than five surveys and with more than ten observations across all surveys. Two species (common tern and guillemot) show significant ($P<0.05$) positive correlation between tide height and density, with lesser black-backed gull and razorbill showing weaker non-significant positive correlation. There are likely to be multiple correlated seasonal effects here that make it difficult to unpick the effects of tidal height from, e.g., meteorological effects and this would require substantial investigation across multiple study areas to draw any firm conclusions regarding these relationships.	ES Appendix 13.2, Figure 13.2.5 (Volume 3.3) (Document Reference: 3.3.13)
Collision risk	The RSPB welcome the use of the Stochastic Collision Risk Model (CRM) to predict the mortalities that may arise from collision of birds with rotating turbine blades. We also welcome that the modelling will be carried out with avoidance rates given in the UK SNCBs (SNCB, 2014) advice note.	The SNCB 2014 advice on avoidance rates was used for PEIR, however for the ES and HRA sCRM has been carried out using updated avoidance rates as advised by Natural England.	ES Appendix 13.2 (Document Reference: 3.3.13)
Collision risk	As the Applicant points out, there is more up to date advice on the parameterisation of the CRM due to be published by the SNCBs, and the RSPB will provide commentary on this once we have had an opportunity to review it. A key focus of this is likely to be how the available evidence used in the advice relates to seasonality in gannet behaviour	RSPB's position is noted. As above, for the ES and HRA to accompany the DCO submission, CRM parameters and methodology have been updated to reflect the latest advice from Natural England. For gannet, reduction in density to reflect evidence relating macro-avoidance of OWF turbine arrays has been applied in all seasons, based on advice from Natural England.	ES Appendix 13.2 (Document Reference: 3.3.13)
Displacement (distributional change)	The RSPB notes that the Applicant is using the matrix approach to the assessment of mortality implications of distributional change arising through displacement and barrier effects. We would welcome discussion as to why the SeaBORD approach has not	The SeaBORD modelling approach to displacement is not recommended for use by Natural England.	N/A

PEIR section / issue	Comment	Response	Where addressed in DCO application
	been used, an approach which is more biologically meaningful as it accounts not only for adult mortality but impacts on productivity and chick survival arising from that distributional change.		
Displacement (distributional change)	The RSPB also point out that if the matrix approach is used, that because it does not account for changes in productivity and chick survival, that an appropriate level of precaution is used in determining the displacement and mortality rates, as explicitly recommended in the SNCB guidance	The issue of likely significant effects of displacement on productivity and chick survival is referred to in the ES and RIAA, although it is not possible to make quantitative predictions for any potential changes in productivity and chick survival in relation to displacement. Thus, the displacement assessments focus on likely significant effects on the mortality of adult and subadult birds.	ES Chapter 13, Section 13.6.2.1 (Document Reference: 3.1.15)
Compensation measures	The RSPB welcomes consideration of compensation measures but has not had an opportunity to fully review these (including Draft In Principle Compensation Options Review). However, currently we do not consider there has been full consideration of the mitigation hierarchy nor that there is sufficient evidence for the effectiveness of any of the proposed measures. We will provide more detailed comments when the final proposals are submitted.	RSPB's position is noted. For the DCO submission, refinements have been made to the project design envelope in accordance with the mitigation hierarchy. This is discussed further in the HRA Derogation Case. Compensation measures have been further developed in consultation with the ETG, with evidence presented for success.	Habitats Regulations Derogation: Provision of Evidence (Document Reference: 7.2)

1.2 PINS

1.2.1 Scoping Opinion

Section (Scoping Report)	Comment	Response	Where addressed in DCO application
Table 2.22	Applicant's proposal to scope out disturbance / displacement and barrier effects due to presence of turbines and other infrastructure during construction and decommissioning: No justification for proposing to scope these matters out of the assessment is provided. However, given that disturbance / displacement and barrier effects due to the presence of turbines and other infrastructure are scoped in for, and relevant only to, the operational phase of the Proposed Development, the Inspectorate is satisfied that these impacts can be scoped out of the construction and decommissioning phase assessment. (ID 4.81)	The advice is noted. Natural England has advised that disturbance / displacement effects during construction should be assessed as 50% of those during operation, to account for the installation of turbines on foundations during construction but before an OWF becomes operational. This precautionary approach has been adopted.	ES Chapter 13, Section 13.6.1.1 (Document Reference: 3.1.15)
Para 276 Table 2.22	Applicant's proposal to scope out collision risk during construction and decommissioning: Paragraph 276 states that collision risk from the proposed WTGs and other offshore infrastructure is proposed to be scoped in for the operational phase of the Proposed Development. No justification for proposing to scope this matter out of the construction and decommissioning phase assessment is provided. Furthermore, the potential for collision risk and disturbance associated with vessel movements during the construction and decommissioning phases has not been addressed in the Scoping Report. On this basis, the Inspectorate considers that insufficient evidence has been presented in the Scoping Report to agree to scope this matter out of assessment at this stage; this should be assessed in the ES where significant effects are likely to occur. (ID 4.82)	In relation to offshore wind farms, birds are considered at risk of collision only with rotating turbine blades. The risk of collision with stationary structures (such as offshore substation platforms) and vessels is considered to be very low and not sufficient to be considered a potential impact requiring assessment.	N/A
Section 2.8.1.1	Designated sites and study area: Three designated sites stated to be of relevance to the offshore ornithology assessment are highlighted in section 2.8.1.1 of the Scoping Report. It's stated that a full list of SPAs and Ramsar sites relevant to the Proposed Development will be presented in the HRA screening report. The ES should clearly define the study area that has been applied and list those receptors (including all designated sites and protected / qualifying features) with potential for likely significant effects. The ES should set out the methodology that will be used to establish	A full list of SPAs and Ramsar sites relevant to the Project is presented in the HRA Screening Report and the RIAA. These documents define the study area that has been applied in relation to each SPA and qualifying feature and list all designated sites and protected / qualifying features with likely significant effects.	HRA Screening Report; RIAA Part 4 (document reference: 7.1.4)

Section (Scoping Report)	Comment	Response	Where addressed in DCO application
	the baseline, assess impacts, and the criteria used to identify how significance of effect will be determined. (ID 4.83).		
Section 2.8.3	Potential impacts – habitat loss: Chapter 3.5 (Onshore Ecology) states that the ES will include an assessment of temporary and permanent terrestrial habitat loss. The Inspectorate considers that this assessment should interrelate with, and include appropriate cross-reference to, other relevant assessments of the ES. This should include consideration of the impacts of temporary and long-term terrestrial habitat loss on Offshore Ornithology, including those qualifying / protected features of offshore designations that may rely on terrestrial habitats for breeding, foraging, resting, etc. Where significant effects are likely to occur, the ES should consider not only the direct effects of habitat loss (i.e. on species mortality and abundance), but also consider the effective areas of habitats subject to disturbance and displacement effects (including from noise / vibration, lighting, and the presence and operation of the WTGs) that may serve to diminish the functional size of sensitive and / or protected habitats. (ID 4.84)	Habitat loss within the offshore array area and offshore cable corridor has been considered. The potential for direct effects on offshore ornithology receptors has been scoped out of the offshore ornithology assessment due to the small extent of habitat loss. Habitat loss in these areas has been considered as part of indirect effects (via prey and / or prey habitats). There is no connectivity between offshore ornithology receptors scoped in for assessment and any habitat loss associated with the onshore cable route (as these areas are not of importance to the offshore ornithology receptors). Disturbance and displacement during construction and operation has been scoped in for assessment.	ES Chapter 13, Sections 13.6.1.2, 13.6.1.1, 13.6.2.1 (Document Reference: 3.1.15)
Section 2.8.4	Approach to assessment - collision risk: The ES should set out the Band model, avoidance rates, flight height variations and any other relevant information in the ES. The parameters used within the collision risk model should be detailed, justified and account for the flexibility applied for in the DCO. In addition, the collision risk assessment should explain the extent to which existing monitoring and modelling data has informed the baseline assessment and assumptions made in this context. (ID 4.85)	This advice has been followed for the ES. It is noted that the sCRM has been used.	ES Chapter 13, Section 13.6.2.2 (Document Reference: 3.1.15), ES Appendix 13.2 (Document Reference: 3.3.13)
Section 2.8.4	Approach to assessment – disturbance / displacement: the Applicant should seek to agree the methodology applied to the assessment of disturbance and displacement effects with NE and other relevant bodies, and fully describe the selected methodology in the ES. Where disturbance / displacement effects are anticipated to impact the qualifying features of a European designated site, a full assessment of the impact on all conservation objectives should be undertaken (ID 4.86).	This advice has been followed for the ES and RIAA.	ES Chapter 13, Section 13.6.2.1 (Document Reference: 3.1.15) RIAA Part 4 (Document Reference: 7.1.4).

Section (Scoping Report)	Comment	Response	Where addressed in DCO application
N/A	Mitigation: the ES should describe the level of consideration given to alternative array designs considered (e.g. the number, size, and configuration of WTGs and buffer distances) and any mitigation measures proposed to be incorporated in the array design (e.g. raising of turbine draught height). (ID 4.87)	Design options for the wind turbine array are described and raising of turbine draught height to 26.6m above HAT (above the minimum of 22m for navigation) is included as embedded mitigation for collision risk.	ES Chapter 13, Sections 13.3.2 and 13.3.3 and Table 13.1, (Document Reference: 3.1.15)
N/A	Birds of conservation value: the ES should include a list specifying the birds of conservation value for the assessment. The Applicant should make effort to agree the approach to assigning conservation value to offshore ornithological receptors with relevant consultation bodies. (ID 4.8.8)	Conservation value of offshore ornithology receptors is defined according to the EU Birds Directive (Annex 1 and Regularly Occurring Migratory Species) and published information on conservation status (UK Birds of Conservation Concern).	ES Chapter 13, Section 13.5.1 (Document Reference: 3.1.15)
N/A	The ES should assess the impacts of aviation and navigation lighting on offshore ornithological receptors in the ES, where significant effects are likely to occur.	The effect of lighting has been considered under operational disturbance and displacement.	ES Chapter 13, Section 13.6.2.1 (Document Reference: 3.1.15)

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