NORTH FALLS

Offshore Wind Farm

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

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 areas	The two distinct offshore wind farm areas (including the 'northern array area' and 'southern array area') which together comprise the North Falls offshore wind farm.
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.
Interconnector cable	Cable between the northern and southern array areas
Landfall	The location where the offshore cables come ashore.
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 array areas to the landfall within which the offshore export cables will be located.
Offshore export cables	The cables which bring electricity from the array areas to the landfall.
Offshore substation platform(s)	Fixed structure(s) located within the array areas, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable voltage for export to shore via offshore export cables.
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

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

- Digital video aerial surveys of seabirds and marine mammals at 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 assessment for North Falls Offshore Wind Farm – outline method statement (dated 9 June 2022); and
- Red Throated Divers at North Falls – proposed modelling approach to predict abundance within 12km buffer for assessing operational displacement (dated 14 July 2022).

The consultation comments are listed by consultee and document. Responses indicate, where appropriate / relevant, where a particular comment has been addressed in Chapter 13 Offshore Ornithology of the North Falls PEIR (Volume I).

References are included in the reference list in PEIR Chapter 13 Offshore Ornithology (Section 13.12) (Volume I).

Consultation relating to offshore ornithology has also been undertaken in relation to the Habitats Regulations Assessment (HRA). Comments and responses relating to HRA matters are provided in the following documents:

- Draft Report to Inform Appropriate Assessment (RIAA);
- HRA Screening Report (provided as Appendix 1 of the RIAA); and
- In-principle HRA Compensation Options Review.

1.1 Natural England

1.1.1 Natural England comments on first year survey report

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 Offshore Wind Farm: Annual Report for March 2019 to February 2020. Document No. HP00101-701-01 (05 October 2020)

Section (of response)	Comment	Response	Where addressed in PEIR
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 (NFOW) has undertaken detailed consultation with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the Outer Thames Estuary SPA. The methodology generally follows that for EA1N with some updates based on advice from Natural England.	Report to Inform Appropriate Assessment (RIAA) Section 9.2.3.1; Appendix 13.4 (Volume III); In principle HRA compensation review
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	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	RIAA Section 9.3.3.1; In principle HRA compensation review

Section (of response)	Comment	Response	Where addressed in PEIR
	(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.	compensatory measures for lesser black-backed gulls at the Alde Ore Estuary SPA is included alongside the draft RIAA, to be submitted with the PEIR. Without prejudice evidence to support an HRA derogation case will be provided with the 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 Flamborough and Filey Coast, 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 Flamborough and Filey Coast SPA is included alongside the PEIR. Evidence to support an HRA derogation case will be provided with the DCO application.	RIAA Section 9.4.3.1; In principle HRA compensation review
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	The advice is noted and these issues are considered further on a species / effect basis in the cumulative assessment.	Chapter 13, Section 13.7.3 (Volume I)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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 Outer Thames Estuary SPA, lesser black-backed gull at the Alde-Ore Estuary SPA, and kittiwake at the Flamborough and Filey Coast SPA is included alongside the PEIR. Without-prejudice evidence to support an HRA derogation case will be provided with the DCO application.	In principle HRA compensation review
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	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.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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		

Section (of response)	Comment	Response	Where addressed in PEIR
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.	Appendix 13.2 (Volume III)
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	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.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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 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		

Section (of response)	Comment	Response	Where addressed in PEIR
	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).	Chapter 13, Section 13.6 (Volume I)
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 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.	Appendix 13.2 (Volume III)

1.1.2 Natural England comments on second year survey report

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

Section (of response)	Comment	Response	Where addressed in PEIR
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	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 Statutory Nature Conservation Bodies (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.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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*	There has been detailed correspondence between Natural England and NFOW on this comment. It is 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. As Natural England acknowledge, the distribution of seabirds in offshore areas is highly variable between surveys which is reflected in the high CV values from survey data.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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 precision will likely lead to Natural		

Section (of response)	Comment	Response	Where addressed in PEIR
	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.	Appendix 13.2 (Volume III)
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	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.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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 III)	Appendix 13.5 (Volume III)
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 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	It is 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. In due course pre-construction surveys are likely to be proposed as part of an ornithological monitoring programme for North Falls, at a stage where the key bird species and impacts to be monitored has been clarified through DCO Examination. At this stage it will be clear which are the key species and the power to detect change that will be required during monitoring.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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	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.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	requirement to increase levels of precision for the post-construction surveys?		
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.	Appendix 13.2 (Volume III)

1.1.3 Natural England comments on EIA and HRA outline methodology

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

Section (of response)	Comment	Response	Where addressed in PEIR
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	A tidal offset has been used in CRM for North Falls. Stochastic CRM (sCRM) has been used, as agreed with Natural England. The tidal offset is 26.6m above HAT. CRM input parameters and results have been presented as per Natural England Best Practice Advice for Evidence and Data Standards for OWF Environmental Assessments.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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 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,	NFOW has committed to a 5m increase in airgap in response to stakeholder feedback. The minimum air gap for turbines is set at 26.6m above HAT (27m above MHWS).	Chapter 13, Sections 13.3.2 and 13.3.3 (Volume I)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.	Chapter 13, Section 13.3.2 (Volume I)
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	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.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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.	Appendix 13.2 (Volume III)
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 PEIR.	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
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 PEIR CRM has been carried out using the generic flight height data set referred to by Natural England.	Chapter 13, Section 13.6.2.2 (Volume I), Appendix 13.2 (Volume III)
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 appropriate assessment makes use of data from baseline digital aerial surveys carried out over the Outer Thames Estuary 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) will used where appropriate (this has not been completed for PEIR but will be undertaken for the ES accompanying DCO submission).	RIAA; Appendix 13.4 (Volume III); Chapter 13, Section 13.6.2.1.5 (Volume I)
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	Detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver	RIAA Section 9.2.3.1; Appendix 13.4 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	conducting site characterization and impact 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 Outer Thames Estuary SPA. The last two baseline aerial surveys of North Falls were extended to 12km from the wind farm site boundary in areas 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.	
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) will be used where appropriate (this has not been completed for PEIR but will be undertaken for the ES accompanying DCO submission).	N/A
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	All the named SPAs and a number of additional SPAs for non-seabird migrants have been considered in the HRA screening report. Migratory CRM will be carried out to support the	HRA Screening Report

Section (of response)	Comment	Response	Where addressed in PEIR
	consider sites such as Hamford Water, Stour and Orwell Estuaries, Deben Estuary, Colne Estuary	appropriate assessment for any SPAs screened in for migratory bird species. This has not been completed for PEIR but will be done for the ES accompanying the DCO Submission.	
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 will be carried out for these species for the ES to accompany the DCO submission.	N/A
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.	HRA Screening Report
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 PEIR assessment.	Chapter 13, Section 13.6 (Volume I)
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	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	Chapter 13, Section 13.6.1.1 (Volume I)

Section (of response)	Comment	Response	Where addressed in PEIR
	(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.	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 inter-array cabling is being laid	
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	This advice has been followed. It is considered that mortality rates of 10% are highly precautionary for displaced birds, and that	Chapter 13, Section 13.6.2.1 (Volume I)

Section (of response)	Comment	Response	Where addressed in PEIR
	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. 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.	displacement is likely to result at most in increased mortality of 1% or less.	
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 Outer Thames Estuary SPA. The last two baseline aerial surveys of North Falls were extended to 12km from the wind farm site boundary in areas close to the SPA. These data plus the 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. 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 Section 9.2.3.1; Appendix 13.4 (Volume I); Chapter 13, Sections 13.6.2.1.5 and 13.7.3.1.4 (Volume I)

Section (of response)	Comment	Response	Where addressed in PEIR
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 appropriate assessment for red-throated diver at the Outer Thames Estuary SPA considers the distribution of the species within the SPA.	RIAA 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.	Chapter 13, Section 13.7.3.4 (Volume I)
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	A best-practice protocol for vessel movements in relation to red-throated divers has been included as embedded mitigation	Chapter 13, Section 13.3.3 (Volume I)

Section (of response)	Comment	Response	Where addressed in PEIR
	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]		
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 are based on SNCBs (2014) guidance. It is understood that SNCBs are developing further advice on avoidance rates. Interim advice from Natural England on updated avoidance rates and additional parameters for some species was received after CRM was completed for PEIR. This will be incorporated for the ES supporting the DCO examination.	Chapter 13, Section 13.6.2.2 (Volume I), Appendix 13.2 (Volume III)
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	For PEIR CRM has been carried out with reference to the generic flight height data set referred to by Natural England. The migratory CRM (Wright et al. 2012) will be used for migratory species as appropriate. Migratory CRM has not been completed for PEIR but will be	Chapter 13, Section 13.6.2.2 (Volume I); Appendix 13.2 (Volume III)

[1] *East Anglia ONE North Offshore Wind Farm Appendix A12 to the Natural England's Deadline 4 Submission NE 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 PEIR
	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).	included in the ES which accompanies the DCO submission.	
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 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 were used instead of consented estimates.	Chapter 13, Section 13.6.2.2 (Volume I); RIAA
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	This approach has been applied to HRA screening where colony-specific data on foraging range are available. In general colony-specific data, usually from tracked birds, indicate smaller foraging ranges than the mean maximum +1SD from Woodward et al. (2010). Colony-specific foraging range data, where available, has been referred to in the RIAA provided alongside the PEIR.	HRA Screening Report; RIAA Section 9

Section (of response)	Comment	Response	Where addressed in PEIR
	specific foraging ranges to ensure no relevant colonies are missed from being screened in.		
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.	No new tracking data has been found during the preparation of PEIR. This will be reviewed for the ES which accompanies the DCO submission.	N/A
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 at Flamborough & Filey Coast SPA, and Lesser black-backed gull at Alde Ore Estuary SPA.	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, noting that a number of OWFs in the UK North Sea have recently been consented subject to compensation for kittiwakes at Flamborough and Filey Coast SPA and black-headed gull at Alde-Ore Estuary SPA, and one site for red-throated diver at the Outer Thames Estuary. This approach has been taken in the in combination assessments for the relevant SPAs.	RIAA Section 9
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.	In comments on the HRA Screening report (North Falls 2021c) Natural England has indicated that the 100km approach is acceptable. This approach has been followed with a cross-check to the migratory corridors for species identified in Wright et al. (2012), as advised by Natural England.	HRA Screening Report

Section (of response)	Comment	Response	Where addressed in PEIR
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).	Detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the Outer Thames Estuary SPA. The last two baseline aerial surveys of North Falls (January and February 2021) were extended to 12km from the wind farm site boundary 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 Section 9.2.1.3; Appendix 13.4 (Volume III)
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. Birds from the colony may also interact with the proposal outside the	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) represents an AEoI. A review of options for compensatory measures for lesser black-backed gulls at the	RIAA Section 9.3.3.1; In principle HRA compensation review

Section (of response)	Comment	Response	Where addressed in PEIR
	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.	Alde Ore Estuary SPA is included with the PEIR. Without prejudice evidence to support an HRA derogation case will be 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 Flamborough and Filey Coast 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 Flamborough and Filey Coast SPA is included with the PEIR. Evidence to support an HRA derogation case will be provided with the DCO application.	RIAA Section 9.4.3.1; In principle HRA compensation review
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	It is noted that East Anglia ONE North has been consented subject to an exclusion zone of 8km from the SPA boundary and compensatory measures for red-throated diver at the Outer Thames Estuary. A review of options for compensatory measures for red-throated diver is included with the PEIR. Evidence to support an HRA derogation case will be provided with the DCO application.	

Section (of response)	Comment	Response	Where addressed in PEIR
	mitigation measures such as increasing the buffer between the North Falls and the OTE SPA boundary.		
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 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.	Consideration has been given to mitigation measures as appropriate. A review of options for compensatory measures for key species is included with the PEIR. These have been subject to consultation with Natural England through the Evidence Plan Process. Without prejudice evidence to support an HRA derogation case will be provided with the DCO application.	RIAA; In principle HRA compensation review

1.1.4 Natural England comments on Scoping Report

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

Section (of response)	Comment	Response	Where addressed in PEIR
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.	Detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the Outer Thames Estuary SPA. An in principle derogation case with outline compensatory measures is included with the PEIR.	RIAA Section 9.2.3.1; Appendix 13.4 (Volume III); In principle HRA compensation review
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.'	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	Appendix 13.2 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.	surveys. It is understood that Natural England is content with 15% coverage at North Falls and this issue is considered to be agreed.	
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 (Figure 13.2), 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.	Chapter 13, Section 13.4.2.1 (Volume I); Appendix 13.2 (Volume III); RIAA 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 consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the Outer Thames Estuary SPA. Embedded mitigation for red-throated	Chapter 13, Section 13.3.3; RIAA Section 9.2.3.1; In principle HRA compensation review

Section (of response)	Comment	Response	Where addressed in PEIR
	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.	divers is provided in the form of a best-practice shipping protocol. In addition, a review of options for compensatory measures is included with the PEIR.	
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 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	The advice of Natural England has been followed. Specifically in relation to red-throated diver, the cumulative assessment (PEIR) and in combination appropriate assessments (HRA, Outer Thames Estuary SPA) for this species consider 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.	Chapter 13, Section 13.7.3.1.4 (Volume I); RIAA Section 9.2.3.1

Section (of response)	Comment	Response	Where addressed in PEIR
	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 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.	Chapter 13, Section 13.7 (Volume I); RIAA Section 9
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	Detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the Outer Thames Estuary SPA. Embedded mitigation for red-throated divers is provided in the form of a best-practice shipping protocol. In addition, a review of options for compensatory measures for red-throated diver at the Outer Thames Estuary SPA with outline, is included with the PEIR.	Chapter 13, Section 13.3.3 (Volume I); RIAA Section 9.2.3.1; In principle HRA compensation review

Section (of response)	Comment	Response	Where addressed in PEIR
	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 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.'		
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	The minimum air gap for turbines is set at 26.6m above Highest Astrological Tide (HAT) which is a 5m increase from that proposed at Scoping stage. A review of options for compensatory measures for lesser black-backed gull at the Alde-Ore Estuary SPA is included with the PEIR. Evidence to support an HRA derogation case will be provided with the DCO application.	Chapter 13, Section 13.3.2 (Volume I); In principle HRA compensation review

Section (of response)	Comment	Response	Where addressed in PEIR
	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, 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	By increasing the air gap to 26.6m HAT (27m MHWS), the hub hight increases by the same amount, and hence the height the rotor of the turbine needs to be lifted also increases by this amount. Given the sizes of the turbines in development, having a larger air gap causes issues with lifting. By lifting the rotors/blades/nacelles higher, a larger vessel is needed to carry out the installation. There are currently a limited number of vessels with the required lifting capabilities to install what is expected to be the smallest turbine available at the time of installation, and hence for the larger turbines, there is expected to be fewer capable vessels on the market at the time of installation, though this has not been confirmed by the market. Therefore to increase the minimum air gap further would limit the project's ability to contribute to the targets outlined in Chapter 2 Need for the Project.	

Section (of response)	Comment	Response	Where addressed in PEIR
	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	Using the mean maximum foraging range plus 1SD from Woodward et al. (2019), as advised by Natural England for SPA connectivity, indicates that North Falls lies within the foraging range of kittiwakes at FFC SPA during the breeding season. The assessment has been carried out based on this precautionary assumption. The minimum air gap for turbines is set at 26.6m above HAT. A review of options for compensatory measures for kittiwake at the Flamborough and Filey Coast SPA is included with the PEIR. Evidence to support an HRA derogation case will be provided with the DCO application.	RIAA Section 9.4.3.1; Chapter 13, Section 13.3.3 (Volume I); In principle HRA compensation review

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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 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	Detailed consultation has been undertaken with Natural England over the methodology for appropriate assessment of red-throated diver displacement within the Outer Thames Estuary (OTE) SPA. The last two baseline aerial surveys of North Falls were extended to 12km from the wind farm site boundary 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. The appropriate assessment of displacement in relation to 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.	Chapter 13, Section 13.4.2.1 (Volume I); Appendices 13.2 and 13.4 (Volume III); RIAA Section 9.2.3.1

Section (of response)	Comment	Response	Where addressed in PEIR
	projects (Natural England 2020). We recommend that a similar modelling approach is undertaken for North Falls.		
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	Chapter 13, Section 13.4.2 (Volume I)
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	Detailed consultation has been undertaken with Natural England over the methodology for assessing displacement of red-throated diver. For the appropriate assessment red-throated	RIAA Section 9.2.3.1; Appendix 13.4 (Volume III)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.	diver displacement has been assessed to 12km within the Outer Thames Estuary SPA. The last two baseline aerial surveys of North Falls were extended to 12km from the wind farm site boundary 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. The appropriate assessment of red-throated diver displacement for the OTE SPA has been carried out using these data.	
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	Collision risk modelling (CRM) has been carried out based on the latest available advice from SNCBs, including the Natural England guidance on Best Practice Advice for Evidence and Data Standards, Phase III and consultation with Natural England. Interim advice from Natural England on updated avoidance rates and additional parameters for some species was received after CRM was completed for PEIR. This will be incorporated for the ES supporting the DCO examination.	Chapter 13, Section 13.6.2.2 (Volume I); Appendix 13.2 (Volume III)
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	This advice has been followed in the PEIR.	Chapter 13, Section 13.6.1.2 (Volume I)

Section (of response)	Comment	Response	Where addressed in PEIR
	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.		
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 4.5% of the total array area. This scale of habitat loss is not considered to represent a potential adverse effect on offshore ornithology receptors, either directly or indirectly, and has been scoped out of the PEIR.	Chapter 13, Section 13.3.2 (Volume I)
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 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.	These potential effects are considered in the scoping for cumulative effects.	Chapter 13, Section 13.7.1 (Volume I)
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

Section (of response)	Comment	Response	Where addressed in PEIR
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 ETG meetings and correspondence with Natural England. Use of the stochastic collision risk model and avoidance rates has been agreed. Interim advice from Natural England on updated avoidance rates and additional parameters for some species was received after CRM was completed for PEIR. This will be incorporated for the ES supporting the DCO examination. 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.	Chapter 13, Sections 13.6.2.2 and 13.6.2.1 (Volume I); Appendices 13.2 and 13.4 (Volume III); RIAA Section 9

1.2 RSPB

Feedback received from the RSPB relates primarily to the HRA and therefore comments and responses are reflected in the HRA Screening Report and the In-principle HRA Compensation Options Review.

1.3 PINS

1.3.1 Scoping Opinion

Section (Scoping Report)	Comment	Response	Where addressed in PEIR
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,	Chapter 13, Section 13.6.1.1 (Volume I)
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	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 (Scoping Report)	Comment	Response	Where addressed in PEIR
	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)		
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 the baseline, assess impacts, and the criteria used to identify how significance of effect will be determined. (ID 4.83).	A full list of SPAs and Ramsar sites relevant to the Proposed Development is presented in the HRA Screening Report and the RIAA accompanying the PEIR. 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 potential for likely significant effects.	HRA Screening Report; RIAA

Section (Scoping Report)	Comment	Response	Where addressed in PEIR
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 wind farm site and export 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.	Chapter 13, Sections 13.6.1.2, 13.6.1.1, 13.6.2.1 (Volume I)
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	This advice has been followed for PEIR and it is noted that the stochastic CRM has been used.	Chapter 13, Section 13.6.2.2 (Volume I), Appendix 13.2 (Volume III)

Section (Scoping Report)	Comment	Response	Where addressed in PEIR
	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)		
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 PEIR.	Chapter 13, Section 13.6.2.1 (Volume I)
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.	Chapter 13, Sections 13.3.2 and 13.3.3 and Table 13.1, (Volume I)
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	Conservation value of offshore ornithology receptors is defined according to the EU Birds Directive (Annex 1 and Regularly Occurring Migratory Species) and published	Chapter 13, Section 13.10 (Volume I)

Section (Scoping Report)	Comment	Response	Where addressed in PEIR
	value to offshore ornithological receptors with relevant consultation bodies. (ID 4.8.8)	information on conservation status (UK Birds of Conservation Concern).	
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.	Chapter 13, Section 13.6.2.1 (Volume I)