

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

Appendix C to the Relevant Representations of Natural England Offshore Ornithology

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The construction and operation of the Five Estuaries Offshore Wind Farm located approximately 57km from the Essex Coast in the Southern North Sea.

Planning Inspectorate Reference EN010115

Appendix C - Offshore Ornithology

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

- [APP-040] 5.4 Report to Inform Appropriate Assessment
- [APP-041] 5.4.1 HRA Site Integrity Matrices
- [APP-042] 5.4.2 HRA Screening Report
- [APP-043] 5.4.3 HRA Screening Matrices
- [APP-045] 5.4.5 Lesser Black Backed Gull Habitats Regulations Assessment
- [APP-046] 5.5 Habitats Regulations Derogation Case
- [APP-049] 5.5.3 Lesser Black Backed Gull Compensation Evidence, Site Selection and Roadmap
- [APP-050] 5.5.4 Kittiwake Evidence, Site Selection and Roadmap
- [APP-051] 5.5.5 Guillemot and Razorbill Evidence, Site Selection and Roadmap
- [APP-052] 5.5.6 Lesser Black Backed Gull Implementation and Monitoring Plans
- [APP-053] 5.5.7 Kittiwake Implementation and Monitoring Plans
- [APP-054] 5.5.8 Guillemot and Razorbill Implementation and Monitoring Plans
- [APP-055] 5.5.9 Lesser Black Backed Gull Compensation Site Suitability Report
- [APP-069] 6.2.1 Offshore Project Description
- [APP-073] 6.2.4 Offshore Ornithology
- [APP-103] 6.5.4.1 Offshore Ornithology Technical Report
- [APP-104] 6.5.4.2 Seabird Abundance by Month
- [APP-105] 6.5.4.3 Seabird Densities by Month
- [APP-106] 6.5.4.4 Seabird Abundance by Survey
- [APP-107] 6.5.4.5 Seabird Densities by Survey
- [APP-108] 6.5.4.6 Seabird Peak Seasonal Abundances
- [APP-109] 6.5.4.7 Seabird Peak Seasonal Densities
- [APP-110] 6.5.4.8 Annex showing collision risk model inputs and outputs
- [APP-111] 6.5.4.9 Annex showing seabird distributions recorded in aerial surveys
- [APP-112] 6.5.4.10 Annex showing the collision risk model comparison of modelling results
- [APP-113] 6.5.4.11 Annex showing the design based bootstrap variance estimates
- [APP-114] 6.5.4.12 Annex showing the digital video aerial survey of seabirds and marine mammals 2019-2021
- [APP-115] 6.5.4.13 Annex showing the digital video aerial survey of seabirds and marine mammals 2019-2020
- [APP-116] 6.5.4.14 Annex showing the migratory birds collision risk model
- [APP-117] 6.5.4.15 Annex showing the apportioning note
- [APP-118] 6.5.4.16 Annex showing the population viability analyses
- [APP-250] 9.18.1 Working in proximity to wildlife in the marine environment
- [APP-264] 9.31 Schedule if mitigation route map
- [APP-265] 9.32 Offshore in principle monitoring plan

1. Natural England's Advice and Recommendations

A summary of Natural England's key concerns in relation to offshore ornithology is set out in Table 1. Our detailed advice and recommendations are presented in further detail in Table 2.

Glossary of Acronyms and Abbreviations

AA	Appropriate Assessment
AEoSI	Adverse Effect on Integrity
ANS	Artificial Nesting Structure
AOE SPA	Alde-Ore Estuary Special Protection Area
BDMPS	Biologically Defined Minimum Population Scale/Size
C&D	Construction and Decommissioning
CEA	Cumulative Effects Assessment
CGR	Counterfactual of Population Growth
CPS	Counterfactual of Population Size
CRM	Collision Risk Modelling
DAS	Digital Aerial Survey
DBS	Dogger Bank South
DCO	Development Consent Order
dML	Deemed Marine Licence
EC	Export Cable
EIA	Environmental Impact Assessment
ExA	Examining Authority
FFC	Flamborough and Filey Coast
GU	Guillemot
GX	Gannet
HPAI	Highly Pathogenic Avian Influenza
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
KI	Kittiwake
LBBG	Lesser Black Backed Gull
LCI	Lower Confidence Interval
LSE	Likely Significant Effect
MSc	Master of Science
NE	Natural England
O&M	Operations and Maintenance
OTE	Outer Thames Estuary
OWEKH	Offshore Wind and Knowledge Hub
OWF	Offshore Wind Farm
PDA	Project Development Area
PVA	Population Viability Analysis
RA	Razorbill
RIAA	Report to Inform Appropriate Assessment
RTD	Red-Throated Diver

SADEP	Sheringham and Dudgeon Extensions Project	
sCRM	Stochastic Collision Risk Modelling	
SNCB	Statutory Nature Conservation Body	
SoS	Secretary of State	
SPA	Special Protection Area	
UCI	Upper Confidence Interval	
VE	Five Estuaries	
ZOI	Zone of Influence	

Please note: This appendix should be read in conjunction with the Summary of Key Environmental Concerns contained within our Relevant Representations.

2. Overarching comments on the Offshore Ornithology Impact Assessment

2.1 Natural England's 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards'

- 2.1.1 The Natural England best practice advice was commissioned by Defra's Offshore Wind Enabling Actions Programme. It aims to facilitate the sustainable development of low impact offshore wind by improving consistency and increasing clarity for industry, regulators and other stakeholders over data and evidence requirements at each stage of offshore wind development. The best practice advice was developed in consultation with industry, with representatives from a number of developers involved including RWE.
- 2.1.2 It is based on Natural England's experience of assessing OWF impact assessment applications over many years, and our analysis of best available evidence regarding impacts. It reflects wherever possible the SNCB consensus on impact assessments and will be updated when we consider there is sufficient evidence on a particular topic.
- 2.1.3 As this advice is a 'live' document, we welcome feedback and constructive criticism to inform future updates. However, in order to facilitate change to any advice a holistic sector wide approach is required. Natural England has noted the critique within the Environmental Statement (ES), but our current best practice advice remains unchanged and is unlikely to change during the examination process. We are hopeful that the forthcoming Offshore Wind Evidence & Knowledge Hub (www.OWEKH.com) should help facilitate further sector wide engagement and agreement on how best to assimilate the evolving evidence base into agreed guidance & approaches.
- 2.1.4 Natural England are concerned that a prolonged debate about the best practice advice could distract the Examination from focussing on resolving the outstanding issues with the Applicant's offshore ornithology impact assessment. We consider that these issues are by no means intractable and consider that it would be more beneficial to focus the Applicant's and our efforts on addressing them.

2.2 The Applicant's Characterisation of SNCB advice

- 2.2.1 Whilst we welcome that the Applicant has at times sought to provide analysis that aligns with the advice that Natural England have provided throughout the Evidence Plan process, we are disappointed that this and wider SNCB advice is frequently referred to as "overly precautionary" in comparison to the applicant's "evidence led" approach. The SNCB approach is no less evidence-led than that of the Applicant. It is simply a different interpretation of the same evidence, and one which takes account of the evidence-poor, high-uncertainty environment within which the assessments are carried out, as well as the requirements of the Habitats Regulations. We, therefore, consider that our advice is both proportionate and appropriately precautionary.
- 2.2.2 The question of how best to conduct an impact assessment in the context of a limited understanding of those impacts is ultimately a matter of ecological judgment. Given Natural England's role as the appropriate national conservation body, considerable weight ought to be given to its advice and there should be cogent and compelling reasons for departing from it.

Akester & Anor (On Behalf of the Lymington River Association), R (on the application of) v Department for Environment, Food and Rural Affairs [2010] EWHC 232 (Admin), para 1

Table 1 Summary of Key Issues – Offshore Ornithology

NE Ref	Summary of Key Concerns	Natural England's Recommendations to Resolve Issues.	Risk
C1	An Adverse Effect on Integrity (AEoI) on the Alde-Ore Estuary Special Protection Area (AOE SPA) lesser black-backed gull (LBBG) population is likely, but the estimated mortalities and compensation quantum derived for the derogation case using the Natural England preferred approach appear incorrect.	An updated assessment should clarify the summed predicted mortalities of LBBG due to collision from both the north and south arrays, and, if necessary, the Population Viability Analysis (PVA) should be rerun (with burn-in) to indicate the project alone and incombination effects on the AOE SPA qualifying feature.	
C2	PVAs were run without a burn-in period.	For consistency with Natural England best practice and to improve confidence in the results, we advise the PVAs are re-run with a burn-in period of 5 years and presented in an updated assessment.	
C3	The Applicant has not included an assessment of impacts on the Farnes SPA Razorbill population for the project alone during the Operations and Maintenance (O&M) phase and in-combination during all phases of the development.	Provide the omitted data so an appropriate assessment can be made of the risk posed to protected Razorbill populations at the Farnes SPA.	
C4	Other than for the AOE SPA LBBG population, the Applicant has apportioned adults subject to Habitats Regulations Assessment (HRA) during the breeding season using the generic data presented in Appendix A of Furness (2015), rather than using site-specific data to establish the number of adult- or adult-type birds present. Natural England do not accept the Applicant's approach to apportioning adults based on theoretical generalised stable age structures.	We recommend that for species that can be aged as adult or sub-adult from Digital Aerial Survey (DAS), site-specific data represents the best available evidence for apportioning. Where good quality site-specific ageing data are not available, then Natural England recommend that a precautionary approach should be adopted and all 'adult type' birds (i.e. birds that cannot be distinguished from adults, and hence might be adults) are apportioned as adults.	
C5	The Applicant has applied their preferred displacement (50%) and mortality (1%) rates to the guillemot and razorbill populations at risk at each offshore wind farm (OWF) project included in the incombination assessment for the Flamborough & Filey Coast	Natural England reiterate our pre-application advice that the project should simply add the VE project alone impact (at 70% displacement and 2% mortality) to the total in-combination impact agreed in the	

NE Ref	Summary of Key Concerns	Natural England's Recommendations to Resolve Issues.	Risk
	Special Protection Area (FFC SPA). As well as departing from Natural England advice on this matter, in so doing the Applicant disregards the in-combination impact estimates that have been used by the Secretary of State (SoS) for recently consented OWFs.	Sheringham and Dudgeon Extensions Project OWF (SADEP) Examination. This should be submitted into the Examination.	
	Natural England advises that the in-combination impacts on the FFC SPA populations of guillemot and razorbill are already at level where it has not been possible to rule out adverse effects, and that Five Estuaries (VE) OWF will be adding to this impact.		
C6	In the PVA for guillemot and razorbill, Natural England welcome the presentation of results for a range of project alone and project in-combination displacement and mortality scenarios, but we would like to see 2% rather than 10% mortality at 70% displacement as the worst-case scenario for these species. For the in-combination assessment, this would be consistent with recent advice given to SADEP OWF (ref PINS EN010109) where we advised 70/2 for all projects other than Hornsea 4 where we advised 70/5. It also recognises that SoS will likely base their conclusions on this scenario across all projects and so would be advantageous to present in both the project alone and in-combination assessments.	We advise a PVA run (with burn-in) using the losses estimated from 70% displacement and 2% mortality would present a more realistic worst-case scenario and would generate a more relevant level of loss to compare with other less impactful scenarios.	

Table 2 Natural England's Detailed Advice and Recommendations – Offshore Ornithology.

Natural England's Key Considerations	Natural England's Advice					
Relevant and Written Representations	NE Ref	Ref	Comment	Recommendation	Risk (RAG)	
Project Parameters - Document [APP-069] 6.2.1 Offshore Project [APP-073] 6.2.4 Offshore Ornithol	Descriptio logy	n,				
Project Description & Natural England's Position on Worst Case Scenario or Scenarios	C7	6.2.1 and 6.2.4	No comment required	None		
Baseline Characterisation - Doc [APP-040] 5.4 Report to Inform Ap [APP-069] 6.2.1 Offshore Project [APP-073] 6.2.4 Offshore Ornithol [APP-103] 6.5.4.1 Offshore Ornithol [APP-104] 6.5.4.2 Seabird Abund [APP-105] 6.5.4.3 Seabird Densiti [APP-106] 6.5.4.4 Seabird Abund [APP-107] 6.5.4.5 Seabird Densiti [APP-108] 6.5.4.6 Seabird Peak S [APP-109] 6.5.4.7 Seabird Peak S	opropriate Descriptio logy, lology Tec ance by Mor ances by Sies by Sur Seasonal A	Assessment, hnical Reponth, hth, Survey, vey, Abundance	oort,			
Survey Data Acquisition	C8	6.5.4.1 1-13	A novel approach was used to estimate the variance around the seabird density estimates. The variance is usually calculated using the seabird counts from each survey transect as independent units. However, now digital aerial surveys require fewer transects than boat surveys to cover the PDA this method no longer provides enough precision and confidence in the estimated means.	The approach is satisfactorily shown to improve the precision of the seabird densities for most species (see 6.5. Annex 4.11) and was agreed to be appropriate in this case.		
	C9	6.2.4 Sec	To mitigate the risk to red-throated diver (RTD), commitment to the management of	Natural England is increasingly concerned that disturbance and/or		

Natural England's Key Considerations Natural England's Advice					
Relevant and Written Representations	NE Ref	Ref	Comment	Recommendation	Risk (RAG)
		4.4.3, Table 4.2; 5.4, Sec 11.4.60 -61; 9.18.1, Sec 3.3.2	vessel movements within the OTE SPA +2km buffer (outlined in the DCO) should extend across all phases of the development for both the export cable (EC) and array. Whilst the applicant downplays the amount of additional vessel activity on top of baseline movements within the OTE SPA and asserts impacts on RTD from displacement are minimal, Natural England considers that the conservation objective of concern in this context is not RTD abundance but the availability of unimpacted habitat in the SPA and maintenance of the birds' distribution.	displacement of red-throated divers from the more persistent presence of OWF-related vessels could make a meaningful contribution to in-combination impacts in the OTE SPA. As a result of this we advise that there is a likely significant effect which should be considered in more detail in the Appropriate Assessment (AA). Due to the risk posed by vessel movements Natural England strongly recommends all vessel activity within the SPA +2km buffer be undertaken outside the seasonal restricted period during the Construction and Decommissioning (C&D) of the export cable (EC) and follow Natural England best practice guidelines on vessel movements during all other phases of the development for both the EC and array.	
	C10	6.2.4, 6.5.4.1 1	A design-based approach is used to estimate bird abundance and density. Variations in the seabird abundancies and densities are estimated using a novel approach to improve	Natural England are broadly supportive of the novel approach taken to calculating the design-based estimates. We welcome that	

Natural England's Key Considerations	Natural England's Advice				
Relevant and Written Representations	NE Ref	Ref	Comment	Recommendation	Risk (RAG)
			the precision of the estimates. This approach was discussed during pre-application consultation with the applicant and Natural England are satisfied that it is appropriate.	a comparison is presented against data derived from a standard design-based approach (i.e. using the entire transect as the smallest independent unit for resampling). This supports the claimed improvement in precision, increases the confidence that suitable estimates have been generated, and allows SNCBs to fully consider more general application of the method at other appropriate projects.	
	C11	6.2.4, 6.5.4.1 6	For lesser black-backed gull the PVA analysis was run and presented for both VE and Natural England preferred scenarios, i.e. either using generic adult proportion data and discounting sabbaticals or using site-specific adult proportions and including sabbaticals, respectively. Natural England considers the site-specific age data represents the best available evidence to estimate the proportion of adults in the PDA (see comment below Natural England Ref C27). Moreover, Natural England does not consider the current evidence base sufficient to recommend sabbatical rates of >0 for any species. We acknowledge some birds do not breed every	The Natural England preferred scenarios should be used as the basis of the impact assessment.	

Natural England's Key Considerations	Natural England's Advice				
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			year, but the mean proportions of populations doing so are not well understood, nor are their behaviours or distributions in the breeding season (see comment below Natural England Ref C28).		
	C12	6.5.4.1 0; 6.5.4.8	Natural England welcome the testing and comparison of CRM outputs from the stochLAB package with those obtained from the online shiny app tool.	Natural England agree that using stochLAB makes no material difference to the findings of the CRM.	
	C13	6.5.4.1 6, sec 2.2.5	The PVA modelling was run excluding a 'burn in' period for all species and sites. Natural England best practice advocates that the PVA models are run with a 'burn in' period of five years (Parker et al., 2022; Mobbs et al. 2020). This is to allow the model to reach stability prior the projection period beginning. It is also expected that the log files will be supplied as part of the application to facilitate review and ensure transparency in the specification and parameterisation of the model.	For consistency with Natural England's best practice and to improve confidence in the results we advise the PVAs are re-run with a burn-in period. This will be particularly important where we have advised the PVAs are re-run anyway e.g. for lesser blackbacked gull (see Natural England Ref. C30. below) guillemot and razorbill (see Natural England ref. C31 below).	
Environmental Impact Asses					
[APP-064] 6.1.3.1 Cumulative		ssment Me	etnodology		
[APP-073] 6.2.4 Offshore Ornii [APP-250] 9.18.1 Working in P		ildlife in th	e Marine Environment		
Identified impacts	C14	6.1.3.1, Table 3.2, 6.2.4,	The Cumulative Effects Assessment (CEA) considers an arbitrary 500km Zone of Influence (ZOI) to scope in other projects for consideration. For offshore ornithology,	Natural England advise that the spatial scale for scoping in other projects for consideration in the CEA (i.e., defining a ZOI) should	

Natural England's Key Considerations	Natural England's Advice					
Relevant and Written Representations	NE Ref	Ref	Comment	Recommendation	Risk (RAG)	
		sec. 4.13.4 and 4.13.9	foraging range is an appropriate tool to screen for impacts to breeding birds, but not outside the breeding season. The approach for non-breeding birds is not given.	be based on a suitable evidence base (e.g., the relevant BDMPS). However, we note all the windfarms projects within the UK North Sea and Channel (equivalent to the relevant BDMPS) have been screened into the CEA and so, in this case accept that all significant projects have been scoped into the CEA.		
	C15	6.2.4, sec 4.3, Table 4.52	Natural England highlights that the values used in the in-combination assessment for other English North Sea projects entering the NSIP process in 2024 (Outer Dowsing, Dogger Bank South West and South East, North Falls) are likely to be subject to change through their respective Examinations, particularly where these values are based on those from Preliminary Environmental Information reports.	Natural England recommends the Applicant to contact the relevant developers to agree how updated values based on SNCB advice are shared and disseminated across their Examinations, to ensure the in-combination assessment is updated in a streamlined way.		
Methodology	C16	6.2.4, sec. 4.11.11 0.	CRM has been undertaken using the deterministic Band model. Uncertainty in flight density has been incorporated by estimating collisions using mean, Upper Confidence Interval (UCI) & Lower Confidence Interval (LCI) density estimates. However, other model parameters have not been varied e.g. flight height, except in the stochastic modelling that was undertaken for	Our best practice guidance recommends the use of the stochastic model to fully incorporate uncertainty and variability in input parameters. However, if the deterministic model is to be used (as in this case) we advise that for the key input parameters below, uncertainty		

Natural England's Key Considerations Natural England's Advice					
Relevant and Written Representations	NE Ref	Ref	Comment	Recommendation	Risk (RAG)
			those species the Applicant considered at greater risk of collision. Natural England agree that variation in density is likely to be the most influential and welcome its consideration here. However, we advise that the other sources of variability/uncertainty should also be fully considered. If other parameters (beside bird density) are not varied, Natural England advise that a worst case should be identified and used for all parameters. It is not clear if this has been the case or not, e.g. for flight height. More detail in the form of logfiles for the models run would aid a more detailed review.	around the parameter estimates should be considered on an individual parameter basis: • Monthly bird density; • Flight height; • Avoidance rate; and • Nocturnal activity factor This can be done using the Band (2012) spreadsheet or by running the sCRM model developed by McGregor et al. (2018) or the new stochLAB tool (as the case here for a selected range of the species) by having no variability (i.e., standard deviations) set for any input parameter, and then undertaking multiple runs of the model to account for individual variation in each relevant input parameter. This gives an indication of which parameters might have the most influence on the prediction of collision risk, recognising that individually these will not reflect the effect of uncertainty across all parameters.	
	C17	6.2.4 , secs.	EIA CEA impacts on baseline mortality >1% are not modelled using PVA but considered against other OWF PVAs carried out in the	In general, Natural England guidelines recommend that PVA models are run using JNCC &	

Natural England's Key Considerations	Natural England's Advice				
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		4.13.13 -142	southern North Sea e.g. Norfolk Boreas, East Anglia 3 and Hornsea 4. Cumulative impacts on baseline mortality >1% were found for gannet, great black-backed gull, lesser black-backed gull, herring gull, kittiwake, guillemot, and razorbill during the O&M phase as well as on red-throated diver during the C&D and O&M phases. However, the Applicant only reports comparative estimates of counterfactual population size or reduction in population size for gannet, kittiwake and LBBG.	Natural England's 'Seabird PVA Tool' as a matter of best practice where impacts are likely to increase baseline mortality >1%. Whilst a significant cumulative effect cannot be ruled out for some these species due to the impacts of existing/consented windfarms (see C20 below), Natural England acknowledge that the contribution from VE would not materially affect the overall cumulative impact magnitude. However, use of the PVA tool in this case will also ensure transparency over the approach and consistency across projects. NE therefore recommends the cumulative impacts are assessed further using the PVA tool for these species.	
	C18	6.2.4, secs. 4.10.36 and 4.10.46	The impacts on red-throated diver (RTD) during construction of the EC are stated to be 15 birds per annum (at 100% displacement and 10% mortality) but the impacts from both the array and EC construction is stated as less at 14 birds. The combined impacts must be more or the same but not less than stated for one phase of the work.	Clarity should be provided on if the combined impacts on RTD during the construction phases of the EC and turbine array.	

Natural England's Key Considerations	Natural England's Advice							
Relevant and Written Representations	NE Ref	Ref	Comment	Recommendation	Risk (RAG)			
Have the impacts been avoided/reduced by the use of appropriate mitigation?	C19	9.18.1, secs 3.3.	Procedures to minimise disturbance to red- throated diver during construction, operation, and maintenance activities are in accordance with Condition 12 of the Generation Assets deemed Marine License (dML) in Schedule 10 of the draft Development Consent Order (DCO), and Condition 12 of the Transmission Assets dML in Schedule 11 of the draft DCO. They include a seasonal restriction, 'Export cable installation will not be carried out within the Outer Thames Estuary SPA between 1st November to 31st March inclusive to mitigate disturbance impacts on red throated diver'.	Natural England welcome the seasonal restriction for the export cable but emphasise that it will be essential to mitigate impacts from other aspects of the proposal that could contribute to AEoI at the OTE SPA (see Natural England Ref. C9 above and C21 below). We also highlight the seasonal restriction should be applied to the OTE SPA and a 2km buffer to ensure risk to RTD are minimised according to best practice.				
Assessment Conclusions	C20	6.2.4 Table 4.69	The Applicant's assessment concludes minor adverse (not significant) impacts for all species and impact pathways. Natural England do not agree with the conclusions of this assessment. The Applicant also presents the impacts found to be significant using the Natural England assessment parameters. Again, the Applicant's impact assessments are framed as 'evidence-based' compared to Natural England's being 'precautionary'. As previously noted, Natural England do not agree with this characterisation of the contrasting approaches. Furthermore, we note that the 'NE residual significance' presented does not always align with the	Natural England has already identified significant adverse impacts at the EIA scale to gannet, kittiwake, great black-backed gull, guillemot, razorbill and redthroated diver from OWF in the North Sea, irrespective of whether the Five Estuaries is included in the cumulative totals. The project will therefore be making an additional contribution to those totals. We advise the Applicant review the EIA section of Natural England's final offshore ornithology advice into the SADEP Examination for further information				

Natural England's Key Considerations	Natural England's Advice							
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			Natural England position on EIA scale impacts.	(REP8-102), and make updates to the CEA as necessary.				
	C21	6.2.4, sec 4.10.17	The sensitivity of red-throated divers to disturbance effects from offshore developments are described in this section but using examples of research that do not illustrate the full scale of the impact. Garthe et al. 2023 review the evidence well and more clearly detail the large-scale effects of OWF on this species e.g. reduction in bird densities up to 9-12km for the OWF footprints. Burger et al. 2019 also show effects from shipping up to 3km distance and slower re-occupation rates to areas passed by fast moving vessels.	A more representative description of the scale of impacts likely on RTD (reflecting the Applicant's own review of RTD sensitivity presented in doc. 6.2.4 secs. 4.11.25-4.11.34) would be better to allow the examiners to fully appreciate the mitigation necessary to maintain the integrity of the OTE SPA qualifying feature. The conservation objective of key concern here is "the distribution of the qualifying features within the site", not RTD mortality. Consequently, if RTD are displaced from an area of the SPA, then the conservation objective is hindered. Appropriate mitigation such as the planned seasonal restriction on cable installation and adoption of the best practice protocol for other construction and O&M vessels in the OTE SPA +2km buffer will be essential to guarantee no AEoI.				
	C22	6.2.4, sec.	The Applicant downplays the impact on auks caused by OWF induced displacement. The assessment asserts i) evidence for auk	We recommend that the ExA should consider the following				

Natural England's Key Considerations	Natural England's Advice						
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		4.11.73 ; 5.4, sec. 11.4.35 -38	displacement is incomplete and may reduce with habituation. ii) OWFs may increase food availability for auks by enhancing fish populations and iii) displacement caused mortality is likely to be zero as the alternative remaining habitat remains vast. However, in the absence of any compelling evidence to demonstrate any of the above either way, the prospect of displacement being a significant issue scenario cannot be ignored, particularly as the risk of displacement induced mortality may increase as the area of sea under development as well as other human-induced pressures continue to grow. This is of particular concern in the southern North Sea given the level of existing and proposed development. Our position on much of the evidence presented here (particularly the APEM review) has previously been stated within the examination of the Hornsea 4 project, see EN010098-001249-Natural England - Comments on any other submissions received at Deadline 1.pdf (planninginspectorate.gov.uk).	alongside the Applicant's assertions: There is an established evidence base in support of guillemot displacement from OWFs (see overview by Dierschke et al. 2016; Vanermen et al. 2015; Peschko et al. 2020a, b; Mercker et al. 2021a). While displacement effects on auks remain poorly understood and may prove to be variable, Natural England note a recent study has highlighted the potential for displacement to occur over much greater distances (up to ~20km) than are typically assessed or considered by baseline characterisation surveys (Peschko et al. 2024). Natural England are not aware of any evidence for habituation, and thus, declining displacement of auks from OWFs over time. Guillemots and seabirds in general also continue to experience multiple human induced pressures			

Natural England's Key Considerations	Natural I	Natural England's Advice					
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				that offshore developments are at risk of accentuating.			
				Therefore, Natural England do not consider our advised approach to the impact assessment to be unduly precautionary and question the characterisation of it as such in light of the evidence base and high levels of uncertainty regarding the consequences of displacement.			
[APP-050] 5.5.4 Kittiwake – Ev [APP-051] 5.5.5 Guillemot and [APP-052] 5.5.6 Lesser Black [APP-053] 5.5.7 Kittiwake Impl [APP-054] 5.5.8 Guillemot and [APP-055] 5.5.9 Lesser Black [APP-073] 6.2.4 Offshore Ornit	Backed Gull C vidence, Site S I Razorbill Evi Backed Gull II Iementation a I Razorbill Imp Backed Gull C thology, [APP	Selection a dence, Sit mplement nd Monito blementati Compensa -103] 6.5.4	e Selection and Roadmap, ation and Monitoring Plan, ring Plan, on and Monitoring Plan, tion Site Suitability Report, 4.1 Offshore Ornithology Technical Report				
Screening	C23	5.4.2, Table 4.15, Fig. 4.4	Potential transboundary impacts on Alderney's Ramsar site and the Cote de Granit Rose-Sept Isles have been omitted from the screening process, yet both contain important seabird populations, notably gannet.	We notice these sites have been omitted from the transboundary impact assessment yet populations of gannets from both sites were considered in the pre-application phase and during discussions with Natural England about apportioning birds to FFC SPA.			

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	C24	5.4.2, Table 4.14. 5.4, secs. 11.4 and 12.4	Both guillemot and razorbill populations at the Farnes SPA were screened in for HRA due to risk of LSE from direct disturbance and displacement in the non-breeding season. However, the applicant has omitted to add an assessment of impacts on Razorbill for the project alone during the O&M phase and incombination during all phases of the development.	Until the Applicant provides a full assessment of LSE on the Farnes SPA population of razorbill for both project alone and in-combination with other projects, Natural England are unable to agree the overall impact of the project on the protected populations of Razorbill.				
	C25	5.4, secs.1 1.4.74- 173	Impacts predicted during the C&D phase are not presented in matrices for guillemot (GU) and razorbill (RA) at the Farnes SPA, and for gannet (GX), GU and RA at the FFC SPA. As noted above, impacts predicted during the O&M phase are not presented in a matrix for RA at the Farnes SPA.	Follow Natural England's best practice guidelines and in the interests of transparency present displacement matrices for all species screened into the HRA.				
Assessment	C26	5.4, sec. 11.4.3 3, Table; 11.22; 6.5.4.1 5, sec. 2.2.9- 12, sec. 3.1.2	Natural England agrees with the Applicant's apportioning of lesser black-backed gull to the Alde Ore Estuary SPA in the breeding season (subject to clarification of the exact figure - see NE Ref. C30 below) as well as its SPA apportioning of gannet to the FFC SPA.	Natural England agrees with the SPA (40%) and adult (79%) apportioning for lesser blackbacked gull at the AOE SPA as well as the SPA apportioning figure for gannet at the FFC SPA (74%).				
	C27	5.4, sec.	Natural England does not agree with the Applicant's process for adult apportioning	Natural England continues to advise that for species that can be				

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		11.4.3 3, Table; 11.22; 6.5.4.1 5, sec. 2.2.9- 12, sec. 3.1.2	subject to HRA, notably the breeding population of gannets at the FFC SPA. The Applicant considers Furness (2015) to provide a more accurate representation of population age structure than site-based data, due to the proportion of individuals aged within the latter. The Applicant also argues that Furness (2015) draws upon a wide number of data sources gathered across multiple years to model population age structure, and so reduces the potential for any bias associated with the snapshot nature of site-based surveys. Natural England disagrees with the Applicant's reasoning. It is considered highly unlikely that a stable age structure, modelled for a very large geographic region, will be representative of the VE project area. Furthermore, we believe it should be possible to age a representative sample of gannets from DAS data. Natural England, therefore, do not accept the Applicant's approach to apportioning adult gannets (or other species) to the FFC SPA. Natural England regards these unlikely to be representative of the actual proportions of adults present within specific areas at	aged as adult or sub-adult from DAS, site-specific data represents the best available evidence for apportioning and that this should be used wherever possible. In cases of small sample sizes of aged birds for species such as gannet, we recommend engagement with DAS providers to ensure the aged proportion is as high as possible. For example, more detailed/focused analysis of imagery by more experienced analysts may yield better results. Where good quality site-specific ageing data are not available, then Natural England recommend that a precautionary approach should be adopted and all 'adult type' birds (i.e. birds that cannot be distinguished from adults, and hence might be adults) are apportioned as adults. We also suggest that the apportioning of adult birds should be season-specific to account for any seasonal variations in the use of the site.				

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			different times of year. This constitutes a significant source of uncertainty which could lead to over, or more importantly, underestimation of impacts. We note that the proportion of gannets aged as adult from the baseline data suggests a significant risk that using the stable age structure could significantly underestimate that number of adult birds present.	An updated assessment based on Natural England's advised approach should be submitted into the Examination in due course.			
	C28	6.5.4.1 5 sec. 2.2.15- 21	Sabbatical rates were incorporated into the assessment (where they were available). We note that "The sabbatical rates presented align with those recommended by Marine Scotland for the Seagreen Phase 1 Offshore Project (Marine Scotland, 2017)." The rates adopted by the Applicant, taken from guidance supplied to a Scottish OWF by Marine Scotland seven years ago, were specifically for inclusion within a PVA model, not apportioning. Further, the use of these rates is not justified or evidenced in the cited document. Expert review of the seabird demographic rates presented by Horswill & Robinson (2015) and the literature used to inform them should introduce significant caution in any consideration of sabbaticals during impact assessment. In short, there are insufficient	Natural England does not consider the current evidence base sufficient to recommend sabbatical rates of >0 for any seabird species. We therefore welcome the presentation of results derived from adult populations that have not been altered to take sabbaticals into account. We advise that integrity judgements should be based on assessments that do not remove sabbatical birds at the apportioning stage.			

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			studies to inform a full understanding and no clear basis to extrapolate findings to other colonies. Further, it is highly uncertain that historic findings remain relevant now, or for the extended period that OWF projects may impacts on populations. Key issues that currently preclude the proper consideration of sabbaticals but were apparently not considered by the Applicant, are briefly detailed below. • Mean proportions of populations expected to take sabbaticals are poorly understood. Temporal and spatial variation of sabbatical rates remains largely unknown. Thus, we have no basis to assign rates to breeding populations that are not directly studied. • The behaviour of sabbatical birds is unknown. We do not know if they are present at colonies, or how they forage. Thus, we do not understand their potential impact exposure. • It is possible that sabbatical birds contribute to some colony population estimates if they are present in breeding habitat during counts. Further, if they do remain at colonies (e.g. defending a nest site) some		

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	C29	2.2.20	sabbatical birds may even inform productivity rates calculated for breeding populations. This would need to be accounted for in impact assessment. • Sabbatical birds are part of the breeding population and their potential impact exposure compared to breeding birds is not known. • Natural England acknowledges that sabbaticals are an important consideration for improving impact estimates and represent a knowledge gap. However, at present we do not believe that simply removing them from assessments during apportioning is appropriate. This section of the ES states that "For lesser black-backed gull, research has also shown that up to 40% of individuals which have previously bred may fail to breed in a given year, and therefore the value of 35% advocated by Marine Scotland (2017) is considered to be both relevant and sufficiently precautionary." We highlight that the studies referenced in the Horswill & Robinson (2015) review are	The Applicant should cite this research so it can be appraised.	
			dated and from a single colony, and not geographically relevant. Calladine & Harris		

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	C30	5.4,	(1997) reported missed breeding events at the Isle of May over just two breeding seasons, finding 34% (n=143) and 40% (n=149) of marked lesser black-backed gulls failed to breed in 1993 and 1994, respectively. Natural England are not persuaded that a sabbatical rate of 35% can be considered either relevant or precautionary on this basis. Lesser black-backed gull mortality per annum	Natural England are unable to fully		
	C30	5.4, sec. 11.4.2 20, Tables 11.35, 11.37 and 12.30; 6.5.4.1 6, Tables 3.1 and 4.1	caused by collisions during the O&M phase are quoted in the RIAA (5.4, sec. 11.4.220) and PVA document (6.5.4.16 Tables 3.1 and 4.1) as 11.31 birds per annum (calculated using Natural England's preferred methodology) yet the total losses from both the north (11.09 birds) and south (3.61 birds) during the breeding season would be 14.7 birds, according to Table 11.35 in the RIAA (doc 5.4 pg. 390). In addition to the predicted 0.22 breeding adult collisions per annum in the non-breeding season this would more accurately equate to 14.92 birds per annum. It is therefore unclear to Natural England what the total losses were, and if they have been applied correctly to the PVA.	assess or agree the impacts of the project on lesser black-backed gull. To do so the Applicant must clarify the total lesser black-backed gull losses per annum calculated using the Natural England preferred approach (i.e. including the combined impacts of both the north and south arrays) and run a PVA (with a 5-year burn-in) using the appropriate figure to assess the project alone and in-combination effects on the AOE SPA lesser black-backed gull population.		
			Furthermore, in the PVA report (6.5.4.16) the Counterfactual of Population Growth (CGR) and Counterfactual Population Size (CPS)			

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	C31	6.5.4.1 6, secs. 3.5 and 3.6; 6.2.4 sec. 4.11.7	figures in Table 4.1 do not fully match those given in Table 12.30 in the RIAA (5.4). In the PVA for guillemot and razorbill, Natural England welcome the presentation of results for a range of project alone and project incombination displacement and mortality scenarios but, consistent with recent advice given to SADEP OWF (ref PINS EN010109) for in-combination assessments Natural England would regard 2% rather than 10% mortality at 70% displacement a more realistic worst-case scenario to be modelled for these species (with the exception of Hornsea 4, where we consider a 5% mortality rate is warranted).	We advise a PVA run using the losses estimated from 70% displacement and 2% mortality (with 5% mortality for Hornsea 4) would present a more realistic worst-case scenario and would make a more relevant comparison of likely effects on the guillemot and razorbill populations over the lifetime of the project. Furthermore, the absence of displacement matrices for some sites and species in the RIAA e.g. guillemot and razorbill at the Farnes SPA, makes any judgement of the impacts from alternative levels of displacement and mortalities impossible for the reviewer (see note above Natural England Ref. C25).				
	C32	5.4, secs. 12.4.2 9, 12.4.4	The Applicant has applied their preferred displacement (50%) and mortality (1%) rates to the guillemot and razorbill populations at risk at each OWF project included in the incombination assessment for the FFC SPA. As well as departing from Natural England advice on this matter, in so doing the	Natural England advises that the in-combination impacts on the FFC SPA populations of guillemot and razorbill are already at level where it has not been possible to rule out adverse effects, and that Five				

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			Applicant disregards impact estimates that were agreed by the SoS for recently consented OWFs. We highlight that the Applicant's adopted approach has calculated a predicted total incombination annual mortality for guillemot of just 465 birds. However, the project alone impact arising from Hornsea 4 was suggested by the ExA and agreed by SoS to be 452 birds per annum (Desnz HRA - Hornsea Project 4 (planninginspectorate.gov.uk)). In this light, Natural England do not consider the presented in-combination assessment to be fit for purpose.	Estuaries (VE) OWF will be adding to this impact. With this in mind, Natural England reiterate our advice above (Natural England Ref. C31) that the project should simply add the VE project alone impact (at rates of 70% displacement and 2% mortality) to the total in-combination impact agreed in the SADEP examination.			
	C33	5.4, sec 11.4.2 35	In the CRM for migratory waterbirds all species assessed were assumed to fly at rotor height at a precautionary 100% of the time except dark-bellied Brent goose. Brent geese were assessed instead at the less precautionary rate of 50% but a clear evidence-based reason was not given.	Provide evidence to indicate why Brent geese can be treated differently in this case - enabling their migratory CRM to be run using a less precautionary figure.			
	C34	11.4.5 4- 11.4.7 3	In the RTD assessment, the Furness (2015) is migration free season used (i.e. impacts are only estimated for December and January).	Assess the impacts on RTD according to the seasonality defined in the OTE SPA conservation advice (i.e. October to May).			

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In- combination	C35	6.2.4, 4.13.1 2	VE and North Falls projects are sharing the Export Cable Corridor (ECC), working in collaboration to coordinate construction and limit disturbance.	Natural England welcomes the collaboration with North Falls OWF to coordinate construction and limit potential disturbance along the shared ECC.			
	C36	5.4, sec 12.4.1 17-123	The Applicant notes that some of the operating OWF were not built to full capacity and that their predicted impacts would be less in reality than stated, thereby providing some 'headroom' in the in-combination assessment. In particular, the Applicant suggest that if the impacts from Galloper on kittiwake, guillemot and LBBG are revised to take account of headroom the number of mortalities released would exceed those predicted for the project and negate the need for derogation cases for at least kittiwake and guillemot. However, Natural England note that this would not be the case if the Applicant calculated their losses from collision using Natural England's preferred approach to the CRM analyses rather than their own. Natural England are actively engaged with industry considering ways that 'as-built' parameters can be used within assessments. However, at present we do not consider it appropriate to reduce impact estimates by	Natural England advises that consent decisions should be based on cumulative/in-combination totals based on 'as consented' parameters within all relevant assessments. Speculation of impacts from as built scenarios in CEA are of little value unless legal agreements are put in place to ensure existing projects will not expand further.			

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Further Receptor Points	C37	5.4, sec. 11.4.3	considering as-built parameters unless those parameters are legally secured. In any event, the reduction of impacts from Galloper cannot be assumed to bring down the in-combination total to a level that would result in a conclusion of no AEOI and therefore avoid the need for Five Estuaries to provide compensation for its contribution. That Galloper is a sister project to Five Estuaries is moot. The Applicant's review points out that guillemot displacement rates may be reduced during the breeding bio-season by ~20% compared with the non-breeding bioseason which is of importance considering the mean displacement rates derived from the Dierschke's (2016) review were predominantly from data collected in the nonbreeding bio-season. While Natural England do not disagree that auk displacement rates appear to be reduced for breeding birds in the breeding season (e.g. as found at Robin Rigg OWF where breeding guillemots were not found to be displaced), we note that the Applicant is only assessing displacement of auks in the non-breeding season.	See note above (Natural England Ref C36).	

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	C38	5.4. sec. 11.4.2 14; 6.5.4.1 5, sec. 2.2.23 & Table 2.5	The Applicant reports in the RIAA that 40% of lesser black-backed gull were apportioned to the AOE SPA yet the Apportioning Note presents two different figures in the text e.g. sec. 2.2.23, 40%, and Table 2.5, 35.5%.	In the analyses, clarify if 40% of LBBG (as agreed with NE) were apportioned to the AOE SPA during the breeding season or not.			
	C39	5.4 11.4.3 9	The Applicant states that for auk species "Potential LSE for migratory birds has been ruled out as they do not forage or roost in the array area and only transit through the area during migration".	The Applicant should evidence this statement. Natural England consider it entirely reasonable to assume that migrating auks may forage and roost in the array area during migration.			
	C40	9.3.2 sec 4.5.3	Post-consent monitoring is focused entirely on compensatory measures. Post-consent monitoring of the OWF could help clarify the key risks such as those posed to LBBG from collision.	A post consent monitoring plan would be beneficial. Data acquired could be used to validate predictions and assumptions made within the application but also help to detect unforeseen effects and address uncertainty: something that could help reduce the current level of precaution deemed necessary in the assessment.			
Assessment Conclusions	C41	Gener al	We are unable to agree the effects of the project on some species subject to HRA. Clarification is required on the scale of impacts on the guillemot and razorbill	Seabirds continue to experience multiple human induced pressures that offshore developments are at risk of accentuating. The numbers			

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			populations breeding at the Farnes and FFC SPAs, the kittiwake and gannet populations at the FFC SPA and the lesser black-backed gull population at the AOE SPA. Until this is resolved we are unable to agree the scale of compensation required to off-set the losses predicted for these species.	of LBBG breeding at the AOE SPA are well below the population size at its classification. As well as for this population, the SoS has already agreed that in-combination there is AEoSI at FFC SPA for kittiwake and guillemot. Therefore, it is important that the Applicant assesses the impacts with appropriate precaution and follows Natural England best practice guidance so that we can		
				provide our integrity judgements based on appropriate information.		
Compensatory measures	C42	5.5.5. sec 3.1 & 3.2	The Applicant gives an unhelpful and misleadingly brief outline of the current status and recent population trends for guillemot and razorbill.	According to Burnell et al. 2023 UK guillemot numbers have declined 8% since the last count (Seabird 2000) – halting an increase that has occurred since the Operation Seafarer counts (1969-70). The recent declines occurred mostly in the north (Scotland) and contrast with a marked increase in England including the south-west. For razorbill, despite slight declines in Scotland, overall numbers have increased 18% (since Seabird 2000), primarily at English and		

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				Welsh sites, including the southwest.	
	C43	Gener al	Proposed VE compensatory measures	Please refer to our detailed comments on the ornithology compensation in Natural England Appendix D.	