



**SCOTTISHPOWER
RENEWABLES**

East Anglia TWO and East Anglia ONE North Offshore Windfarms

Deadline 11 Offshore Ornithology Cumulative and In-Combination Collision Risk and Displacement Update

Applicants: East Anglia TWO Limited / East Anglia ONE North Limited

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Applicable to East Anglia TWO and East Anglia ONE North



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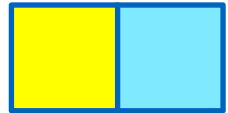


Table of Contents

1	Introduction	1
2	Examination Updates	12
2.1	Apportioning of kittiwake and gannet for East Anglia TWO	12
2.2	Changes to the East Anglia ONE North boundary	12
2.3	Increase of draught height	13
2.4	In-combination totals	13
3	Updated cumulative and in-combination collisions	15
4	Conclusion	16
5	References	17
	Appendix 1 Updated Cumulative and In-Combination Collision Risk and Displacement Tables	18
	Introduction	18
	Collision Risk	18
	Gannet	18
	Kittiwake	22
	Lesser Black-Backed Gull	25
	Herring gull	28
	Great black-backed gull	31
	Displacement	34
	Guillemot	34
	Razorbill	38
	Gannet	42



Glossary of Acronyms

AEoI	Adverse Effect on Integrity
AOE	Alde-Ore Estuary
CRM	Collision Risk Model
DEP	Dudgeon Extension Project
FFC	Flamborough and Filey Coast
GBBG	Great Black-Backed Gull
HRA	Habitats Regulations Assessment
LBBG	Lesser Black-Backed Gull
ISAA	Information to Support Appropriate Assessment Report
MHWS	Mean High Water Springs
MSL	Mean Sea Level
NE	Natural England
NMC	Non-material change
PEI	Preliminary Environmental Information
SEP	Sheringham Shoal Extension Project
SPA	Special Protection Area

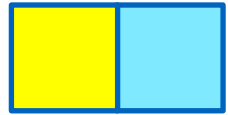


Glossary of Terminology

Applicant	East Anglia TWO Limited / East Anglia ONE North Limited
Construction operation and maintenance platform	A fixed offshore structure required for construction, operation, and maintenance personnel and activities.
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia TWO windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Generation Deemed Marine Licence (DML)	The deemed marine licence in respect of the generation assets set out within Schedule 13 of the draft DCO.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, these cables will include fibre optic cables.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Meteorological mast	An offshore structure which contains metrological instruments used for wind data acquisition.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.
Marking buoys	Buoys to delineate spatial features / restrictions within the offshore development area.



Monitoring buoys	Buoys to monitor <i>in situ</i> condition within the windfarm, for example wave and metocean conditions.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and landfall.
Offshore development area	The East Anglia TWO / East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs).
Offshore electrical infrastructure	The transmission assets required to export generated electricity to shore. This includes inter-array cables from the wind turbines to the offshore electrical platforms, offshore electrical platforms, platform link cables and export cables from the offshore electrical platforms to the landfall.
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall. These cables will include fibre optic cables.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.
Offshore platform	A collective term for the construction, operation and maintenance platform and the offshore electrical platforms.
Platform link cable	Electrical cable which links one or more offshore platforms. These cables will include fibre optic cables.
Safety zones	A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.
Transmission DML	The deemed marine licence in respect of the transmission assets set out within Schedule 14 of the draft DCO.



1 Introduction

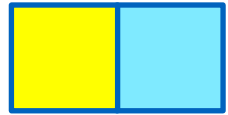
1. This cumulative and in-combination collision risk and displacement document is an updated version of the collision risk document submitted at Deadline 8 (REP8-035). Natural England provided comments on REP8-035 in REP9-066. This updated version addresses those comments and provides revised tables of cumulative and in-combination collision risk for the following species:
 - **Gannet**;
 - **Kittiwake**
 - **Lesser Black-Backed Gull**
 - **Herring gull**; and
 - **Great black-backed gull**.
2. And displacement for the following species
 - **Guillemot**;
 - **Razorbill**; and
 - **Gannet**.
3. To assist in understanding the changes made, Natural England's comments from REP9-066 are reproduced in **Table 1** with the Applicants' responses. The Applicants also note that the Hornsea Project Three developer has now provided updated collision estimates. These have been included in the cumulative and in-combination collision tables as appropriate as well as the revised figures for East Anglia THREE for which a non-material change was granted in April 2021.

Table 1.1 Applicants' Response to Natural England comments provided in REP9-066

No.	Natural England comment (REP9-066)	Applicant's response
1.1	Natural England welcomes the corrections and updates made by the Applicants to the figures presented in the Tables in Appendix 1 of REP8-035 and we agree with these figures.	No response required.



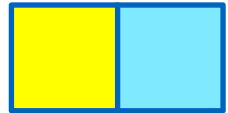
No.	Natural England comment (REP9-066)	Applicant's response
1.2	<p>We have the following queries regarding the information presented:</p> <ul style="list-style-type: none"> The last bullet point of paragraph 1 states that: 'the East Anglia Two estimates for gannet and kittiwake apportioned to the Flamborough and Filey Coast SPA have been updated to use the migration free breeding season.' This sentence contradicts Section 2 of REP8-035, which suggests that the figures for EA2 have been updated to use the full breeding season rather than the migration season (as was done at EA1N following Natural England advice). Clarification is therefore required that it is in fact the full breeding season that has now been used. 	<p>There were some errors in REP8-035 which meant that some of the values presented were incorrectly assigned to seasons.</p> <p>For the avoidance of doubt, the figures in the current update are all based on use of the <u>full breeding season</u>.</p>
	<p>The Applicants' state in paragraph 3 that: 'For the avoidance of doubt the collision risk modelling itself is not affected (i.e. the EIA and CIA figures), the only change is the months which are treated as part of the breeding or non-breeding seasons, and hence what proportion of the total collisions in those months are apportioned to the FFC SPA populations. The changes for East Anglia TWO are provided in Table 1 and incorporated in Appendix 1 (from use of migration free to full breeding season).' However, we note that using the full breeding season instead of the migration free breeding season and adjusting the migration months accordingly does alter the collision predictions for the EA2 site alone, and therefore these predictions are the ones that should be taken through to the in-combination total.</p>	<p>The Applicants' intention with this statement was to explain that the collision risk modelling itself had not been re-run as there was no need to do so and therefore the total collision estimates in each month were unchanged from previous submissions. The aspect which was revised in REP8-035 was the percentage of those collisions in each month which were apportioned to the SPA populations, reflecting the change from application of the migration-free breeding season to the full breeding season.</p>
	<ul style="list-style-type: none"> We note that the tables in Appendix 1 for both gannet and kittiwake include figures for EA2 based on use of the migration free breeding season and not the full breeding season. However, we recognise that adjusting these does not significantly alter the in-combination totals for these species. 	<p>As stated above, some of the tables for gannet and kittiwake erroneously presented the migration-free breeding season. These figures have been reviewed and replaced as necessary using figures for the full breeding season, as per Natural England's advice.</p>



No.	Natural England comment (REP9-066)	Applicant's response
	<ul style="list-style-type: none"> We note that there are some errors in the data presented for EIA and HRA for EA2 for gannet in Table A0.1 of Appendix 1 – currently the breeding season collision figure apportioned to the Flamborough and Filey Coast (FFC) SPA exceeds the EIA scale breeding season prediction. The spring migration EIA figure currently exceeds the annual EIA predicted figure, which then affects the FFC SPA apportioned figure for this season. These apparent errors then affect the annual EIA and HRA totals included in the in-combination assessment for EA2, and hence potentially also the cumulative and in-combination predicted totals. Therefore, we advise the Applicants check these figures and totals. Based on the seasonal EIA scale figures presented for both projects in Table A0.2 of Appendix 1 of REP8-035, we query what spring migration apportionment rates have been used by the Applicants to arrive at the spring FFC SPA kittiwake collisions of 0.25 for EA1N and 0.5 for EA2. Using the 7.2% spring apportionment rate (as advised by Natural England during the Norfolk Vanguard and Boreas examinations and which appears to have been used by the Applicants for spring apportionment for all the other projects included in the in-combination assessment), we calculate these figures to be 0.7 for EA1N and 1.3 for EA2. This means that the annual totals for the FFC SPA kittiwakes for these sites would be 1.2 for EA1N and 1.7 for EA2. This makes a slight adjustment to the Applicants' in-combination FFC SPA kittiwake totals presented in Table A0.2 of Appendix 1 of REP8-035. 	<p>While the collision estimates apportioned to the FFC SPA for East Anglia TWO were correctly presented for gannet in Table A0.1 of REP8-035, the EIA figures for East Anglia TWO were incorrect (having not been updated from a previous version of the modelling). These have been corrected in the current document.</p> <p>Errors in these tables suggested that the wrong apportioning rates had been applied. However, the errors were in transferring the data into the document and these have now been corrected. The Applicants confirm that the seasonal apportioning rates advised by Natural England have been applied.</p> <p>The Applicants apologise for any confusion caused by these errors.</p>
1.3	<p>Projects in-combination: We welcome that the Applicants have presented cumulative collision totals for all confirmed projects (i.e. excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard) and for including all projects for gannet, lesser black-backed gull and great black-backed gull. We note that for cumulative collisions (EIA scale) for kittiwake, the Applicants have presented totals for all projects and all projects excluding Hornsea 4 and Norfolk Vanguard. As the Hornsea 3 project has not provided updated collision</p>	<p>The totals have been presented in the current submission following Natural England's advice on this matter.</p> <p>The Applicants also note that the Hornsea Project Three developer has now provided the updated collision estimates referred to by Natural England in this comment. These have been included in the cumulative and in-combination collision tables as appropriate.</p>



No.	Natural England comment (REP9-066)	Applicant's response
	<p>figures following their additional mitigation and additional baseline data for EIA scale for kittiwake, the uncertainty regarding the figures to include for this project remains. Therefore, totals should also be presented for cumulative kittiwake collisions for all projects and all projects excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard (as Natural England have presented in our advice in Appendix A19 of our Deadline 8 response [REP8-035]).</p>	
1.4	<p>Herring gull: We note that no updates have been provided for herring gull cumulative collisions, which is due to the low collisions (less than 1 bird for East Anglia Two and 0 for East Anglia One North) predicted for this species from both East Anglia One North and East Anglia Two. However, as noted in our advice in Appendix A19 of our Deadline 8 response [REP8-035] the cumulative herring gull collision total is now approaching 1% of baseline mortality of the largest BDMPS, indicating the need for all future offshore wind farm projects in the North Sea to undertake herring gull CRM.</p>	<p>The Applicants agree with Natural England that windfarms which contribute to the cumulative collision risks for a species should be included in a cumulative assessment, and also note that cumulative herring gull collisions have previously been provided by the Applicants (e.g. REP1-047). However, given the very small collision figures for the current projects (the sum mortality for both projects is 0.2 individuals) it is clear that the projects make virtually no contribution to the impact on this species and it was therefore unnecessary to update the cumulative tables.</p> <p>Nonetheless, as Hornsea Project Three has now provided the Applicants with updated collision estimates reflecting the consented windfarm design an updated cumulative and in-combination table for herring gull is included in this submission.</p>
1.5	<p>Significance of impacts: The Applicants consider in paragraph 14 that the updates made in REP8-035 do not alter their conclusions of negligible to minor adverse significance for the EIA and no Adverse Effects on Integrity for the HRA within the assessments submitted in AP-060 and APP-043. Natural England does not agree with these conclusions for several species (gannet, kittiwake and gannet cumulative EIA scale) or site combinations (including Flamborough and Filey Coast SPA kittiwakes and Alde-Ore Estuary SPA lesser black-backed gull). A summary of our advice/conclusions is set out in Table 1 below and further details behind this advice is set out in the following species-specific sections.</p>	<p>The Applicants acknowledge Natural England's position on these assessments. However, the Applicants' conclusions remain as previously stated (REP8-035): for all species assessed the impacts are no greater than negligible to minor adverse significance for the EIA and there will be no Adverse Effects on the Integrity of any SPAs.</p>
2 and 2.1	<p>Gannet cumulative and in-combination collisions Cumulative collisions:</p>	<p>The gannet collision table has been checked and updated. As stated in previous submissions the Applicant disagrees with Natural England that a significant cumulative impact cannot be ruled out and considers</p>



No.	Natural England comment (REP9-066)	Applicant's response
	<p>We suggest that the cumulative (EIA) annual gannet collisions presented in Table A0.1 of Appendix 1 of REP8-035 are checked by the Applicant, largely due to the fact that the sum of the seasonal EIA predictions included for EA2 does not appear correct: 10.7 + 24.2 + 47.7 does not equal 39.6 as currently presented. However, based on the figures presented by the Applicant in Table 2 of REP1-047 of revised CRM figures for EA2, we have taken the annual gannet collision prediction for the East Anglia Two project for a draught height of 24m above Mean High Water Springs (MHWS) to be 39.6. Using this figure in the cumulative total, the annual cumulative gannet collision totals are 2,889 for all confirmed projects (i.e. excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard) and 3,031 for all projects including Hornsea 3, Hornsea 4 and Norfolk Vanguard. These match the totals presented by the Applicant in Table A0.1 of Appendix 1 of REP8-035 and also match those presented by Natural England in our advice in Appendix A19 of our Deadline 8 response [REP8-159]. Therefore, our advice regarding gannet cumulative collisions remains as that set out in Appendix A19 of our Deadline 8 response [REP8-159], namely:</p> <p>We are unable to rule out a significant adverse impact on gannet from cumulative collision mortality at an EIA scale irrespective of whether the Hornsea 3, Hornsea 4 and Norfolk Vanguard projects are included in the cumulative totals or not.</p>	<p>that APP-060 provides a robust basis for this conclusion.</p>
2.2	<p>In-combination collisions: The in-combination FFC SPA gannet collision total presented by the Applicants in Table A0.1 of Appendix 1 of REP8-035 for all confirmed projects (i.e. excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard) of 277 is lower than the total for all projects excluding Hornsea 3 and Hornsea 4 presented by Norfolk Boreas, this is because the Norfolk Vanguard figures were included by Boreas, and this project has had its consent revoked since the end of the Boreas examination.</p> <p>The in-combination FFC SPA gannet collision total for all projects including Hornsea 3, Hornsea 4 and Norfolk Vanguard of 358 presented by the Applicants in Table A0.1 of Appendix 1 of REP8-035 has decreased slightly (by 1 for the total including all projects) from that presented by Vattenfall</p>	<p>The gannet collision table has been checked and updated. As stated in previous submissions the Applicant disagrees with Natural England that it is not possible to rule out an AEol on the FFC SPA population and considers that APP-043 provides a robust basis for this conclusion.</p>



No.	Natural England comment (REP9-066)	Applicant's response
	<p>at Deadline 8 of the examination of that project (Norfolk Boreas Ltd 2020). This decline is due to the EA1N/EA2 Applicants' updated assessment revising the figures included for their projects to account for the updated CRM following the increase in draught height (the Boreas assessment included figures from the submission documents for EA1N and EA2), and also removing the contribution of Thanet Extension from the total following the decision not to grant consent for this project (the Boreas assessment included a figure for Thanet Extension).</p> <p>We have assumed that the Applicants have made use of the same PVAs as were used at Norfolk Boreas (the FFC SPA gannet PVA undertaken by Hornsea 3 presented in Hornsea Project Three 2019). Therefore, given that the in-combination totals now presented for all confirmed projects (excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard) are lower than that presented by Boreas for excluding just Hornsea 3 and 4, and that the total for all projects (including Hornsea 3, Hornsea 4 and Norfolk Vanguard) is just 1 bird below the total presented by Norfolk Boreas, our advice remains as set out in our Deadline 4 (Natural England 2020a), Deadline 7 (Natural England 2020b) and Deadline 9 (Natural England 2020c) responses during the Norfolk Boreas examination:</p> <p>An adverse effect on integrity (AEoI) of the gannet feature of the FFC SPA can be ruled out for in-combination collision impacts if Hornsea 3, Hornsea 4 and Norfolk Vanguard are excluded from the in-combination totals.</p> <p>However, due to Natural England's significant concerns regarding the associated level of uncertainty as regards the potential impacts of the Hornsea 3 project, together with the inevitable uncertainty associated with the figures for Hornsea 4 (which are from the PEIR and are subject to change), along with the current status of the Norfolk Vanguard project, Natural England therefore is not in a position to advise that an AEoI can be ruled out for the gannet feature of the FFC SPA for in-combination collision impacts when the Hornsea 3, Hornsea 4 and Norfolk Vanguard projects are included in the in-combination totals.</p>	



No.	Natural England comment (REP9-066)	Applicant's response
3 and 3.1	<p>Kittiwake cumulative and in-combination collisions</p> <p>Cumulative collisions: As noted in our general comments section above, the cumulative kittiwake collision total for all confirmed projects presented by the Applicants in Table A0.2 of Appendix 1 of REP8-035 includes Hornsea 3 in this total. As Hornsea 3 have not provided updated EIA scale kittiwake collision figures following their additional mitigation, this total should also exclude Hornsea 3.</p> <p>Based on the figures presented by the Applicants in Table A0.2 of Appendix 1 of REP8-035, the annual cumulative kittiwake collision totals are 3,835 for all confirmed projects (i.e. excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard) and 4,387 for all projects including Hornsea 3, Hornsea 4 and Norfolk Vanguard. This matches the all project total (including Hornsea 3, Hornsea 4 and Norfolk Vanguard) presented by the Applicant in Table A0.2 of Appendix 1 of REP8-035 and both match those presented by Natural England in our advice in Appendix A19 of our Deadline 8 response [REP8-159]. Therefore, our advice regarding kittiwake cumulative collisions remains as that set out in our advice in Appendix A19 of our Deadline 8 response [REP8-159], namely:</p> <p>We are unable to rule out a significant adverse impact on kittiwake from cumulative collision mortality at an EIA scale irrespective of whether the Hornsea 3, Hornsea 4 and Norfolk Vanguard projects are included in the cumulative totals or not.</p>	<p>The kittiwake collision table has been checked and updated. As stated in previous submissions the Applicant disagrees with Natural England that a significant cumulative impact cannot be ruled out and considers that APP-060 provides a robust basis for this conclusion.</p>
3.2	<p>In-combination: We note that if we correct the apparent error in the spring apportioning and hence annual totals for FFC SPA kittiwake collisions for East Anglia One North and East Anglia Two (as set out above), the revised in-combination totals become 339 collisions per annum for all confirmed projects, i.e. excluding Hornsea 4 and Norfolk Vanguard (compared to 337 as presented in Table A0.2 of Appendix 1 of REP8-035) and 515 for all projects including Hornsea 4 and Norfolk Vanguard (compared to 514 as presented in Table A0.2 of Appendix 1 of REP8-159).</p> <p>The in-combination FFC SPA kittiwake collision total for all projects including Hornsea 3, Hornsea 4 and Norfolk Vanguard of 515 has decreased from that presented by</p>	<p>The kittiwake collision table has been checked and updated. As stated in previous submissions the Applicant disagrees with Natural England that it is not possible to rule out an AEol on the FFC SPA population and considers that APP-043 provides a robust basis for this conclusion.</p>



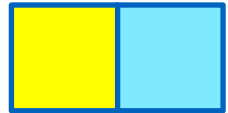
No.	Natural England comment (REP9-066)	Applicant's response
	<p>Vattenfall at Deadline 8 of the examination of that project (Norfolk Boreas Ltd 2020). This decline is due to the EA1N/EA2 Applicants' updated assessment updating the figures included for their projects to account for the updated CRM following the increase in draught height (the Boreas assessment included figures from the submission documents for EA1N/EA2), removal of the contribution of Thanet Extension from the total following the decision not to grant consent for this project (the Boreas assessment included a figure for Thanet Extension) and removal of the contribution of Hornsea 3 (as the impact from this project is considered to be fully compensated for).</p> <p>We have assumed that the Applicants have made use of the same PVAs as were used at Norfolk Boreas (the FFC SPA kittiwake PVA undertaken by Hornsea 3 presented in Hornsea Project Three 2019). The total of 339 for all confirmed projects (i.e. excluding Hornsea 4 and Norfolk Vanguard) would result in use of the same PVA counterfactuals as were used in our Deadline 4 advice at Norfolk Boreas for the in-combination total excluding Hornsea 3 and Hornsea 4 (but including Vanguard) (i.e. PVA outputs for 350 additional mortalities, as the closest PVA output to the in-combination all confirmed project total of 339). We again highlight that the in-combination total of collision mortality across consented plans/projects has already exceeded levels which are considered to be of an Adverse Effect on Integrity to kittiwake at FFC SPA, and that any additional mortality arising from these proposals would therefore be considered adverse. In addition, the issues regarding inevitable uncertainty associated with the figures for Hornsea 4 from the PEIR and are subject to change, along with the current status of the Norfolk Vanguard project remain for FFC SPA kittiwake. Therefore, our advice remains the same as that set out in in our Deadline 4 (Natural England 2020a), Deadline 7 (Natural England 2020b) and Deadline 9 (Natural England 2020c) responses during the Norfolk Boreas examination:</p> <p>As the kittiwake feature of the FFC SPA has a restore conservation objective, and because there are indications that the predicted level of mortality would mean the population could decline from current levels</p>	



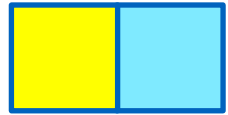
No.	Natural England comment (REP9-066)	Applicant's response
	<p>should it currently be stable, it is not possible to rule out AEol of the kittiwake feature of the FFC SPA for collision impacts from in-combination with other plans and projects, both including and excluding Hornsea 4 and Norfolk Vanguard (contribution from Hornsea 3 is considered to be compensated for).</p>	
<p>4 and 4.1</p>	<p>Lesser black-backed gull (LBBG) cumulative and in-combination collisions</p> <p>Cumulative collisions: Based on the figures presented by the Applicants in Table A0.3 of Appendix 1 of REP8-035, the annual cumulative LBBG collision totals are 509 for all confirmed projects (i.e. excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard) and 540 for all projects including Hornsea 3, Hornsea 4 and Norfolk Vanguard. These match those presented by Natural England in our advice in Appendix A19 of our Deadline 8 response [REP8-159]. Therefore, our advice regarding LBBG cumulative collisions remains as that set out in our Appendix A19 of our Deadline 8 response [REP8-159], namely:</p> <p>We advise a conclusion of no significant adverse impact from cumulative collision to LBBG at an EIA scale if the Hornsea 3, Hornsea 4 and Norfolk Vanguard projects are excluded from the cumulative total.</p> <p>However, due to the associated level of uncertainty as regards the impact figures to include for Hornsea 3, together with the inevitable uncertainty associated with the figures for Hornsea 4 from the PEIR and are subject to change, and the current status of Norfolk Vanguard, Natural England therefore is not in a position to advise that significant impact can be ruled out for LBBG for cumulative collision impacts when the Hornsea 3, Hornsea 4 and Norfolk Vanguard projects are included in the cumulative totals.</p>	<p>The lesser black-backed gull collision table has been checked and updated. As stated in previous submissions the Applicant disagrees with Natural England that a significant cumulative impact cannot be ruled out and considers that APP-060 provides a robust basis for this conclusion.</p>
<p>4.2</p>	<p>In-combination collisions: The in-combination Alde-Ore Estuary SPA LBBG collision total for all projects including Hornsea 3, Hornsea 4 and Norfolk Vanguard presented by the Applicant in Table A0.3 of Appendix 1 of REP8-035 of 53 has decreased slightly (by 1 bird) from that presented by Vattenfall at Deadline 8 of the examination of that project (Norfolk Boreas Ltd 2020). This decline is due to the EA1N /EA2 Applicants' updated assessment updating the figures included for their projects to account for the updated CRM following the increase in draught height</p>	<p>The lesser black-backed gull collision table has been checked and updated. As stated in previous submissions the Applicant disagrees with Natural England that it is not possible to rule out an AEol on the AOE SPA population and considers that APP-043 provides a robust basis for this conclusion.</p>



No.	Natural England comment (REP9-066)	Applicant's response
	<p>(the Boreas assessment included figures from the submission documents for EA1N and EA2), and removal of the contribution of Thanet Extension from the total following the decision not to grant consent for this project (the Boreas assessment included a figure for Thanet Extension). The in-combination total of 50 for all confirmed projects (i.e. excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard, but no birds are apportioned to the Alde-Ore from Hornsea 3 and Hornsea 4) is slightly lower again due to the removal of the contribution from Norfolk Vanguard.</p> <p>We have assumed that the Applicants have made use of the same PVAs as were used at Norfolk Boreas (the Alde-Ore SPA LBBG updated PVA undertaken by Norfolk Vanguard presented in MacArthur Green 2019). Based on the revised in-combination totals of 50 (essentially excluding Norfolk Vanguard only as no birds are apportioned from Hornsea 3 and 4) and 53 including Norfolk Vanguard, using the density independent PVA model outputs in MacArthur Green (2019), if the additional mortality from the windfarm is 50-55 adults per annum (closest PVA outputs available in MacArthur Green (2019) to predicted 50 mortalities for the in-combination total excluding Norfolk Vanguard and to the 53 in-combination total including Norfolk Vanguard) then the population of the Alde-Ore Estuary SPA after 30 years will be 30.6-33.1% lower than it would have been in the absence of the additional mortality. The population growth rate would be reduced by 1.3-1.4% (based on the counterfactuals of population size and growth rate presented in Tables 2 and 3 of MacArthur Green 2019). If it is assumed that the population is stable then this would mean that the population would be 30.6-33.1% lower than the current population size. This would be counter to the restore conservation objective for this feature of the site.</p> <p>Based on the above, and the assessment of the status of the Alde-Ore Estuary SPA LBBG population, plausible future growth rates of the colony etc. detailed in our Deadline 4 (Natural England 2020a) and Deadline 7 (Natural England 2020b) responses during the Norfolk Boreas examination, our advice remains as set out in our Deadline 4 (Natural England 2020a) and Deadline 7 (Natural England 2020b)</p>	



No.	Natural England comment (REP9-066)	Applicant's response
	<p>responses during the Norfolk Boreas examination:</p> <p>As this feature has a restore conservation objective, and because there are indications that the population might even decline from current levels, Natural England advises that it is not possible to rule out an adverse effect on integrity (AEoI) of the LBBG feature of the Alde-Ore Estuary SPA for from in-combination collision impacts with other plans and projects, both including and excluding Norfolk Vanguard (no collisions apportioned from Hornsea 3 or Hornsea 4).</p>	
<p>5 and 5.1</p>	<p>Great black-backed gull (GBBG) cumulative and in-combination collisions</p> <p>Cumulative collisions: The cumulative total for all confirmed projects (i.e. excluding Hornsea 3, Hornsea 4 and Norfolk Vanguard) of 917 in Table A0.4 of Appendix 1 of REP8-035 is slightly higher (3 birds more) than the figure presented by Natural England in our advice in Appendix A19 of our Deadline 8 response [REP8-159].</p> <p>We note that there is a minor error in the annual collision total presented for Hornsea 4 in Table A0.4 of Appendix 1 of REP8-035: 3 collisions in the breeding season + 13.6 in the non-breeding season = 16.6 (not 13.6 as presented). This makes a very minor increase of 3 birds to the all projects (including Hornsea 3, Hornsea 4 and Norfolk Vanguard) cumulative collision totals to 1,026 collisions (rather than 1,023 as presented by the Applicants).</p> <p>These minor differences in the totals highlighted above, do not alter our advice regarding GBBG cumulative collisions set out in our advice in Appendix A19 of our Deadline 8 response [REP8-159], namely:</p> <p>We are unable to rule out a significant adverse impact on GBBG from cumulative collision mortality at an EIA scale irrespective of whether the Hornsea 3, Hornsea 4 and Norfolk Vanguard projects are included in the cumulative totals or not.</p>	<p>The great black-backed gull collision table has been checked and updated. As stated in previous submissions the Applicant disagrees with Natural England that a significant cumulative impact cannot be ruled out and considers that APP-060 provides a robust basis for this conclusion.</p>



2 Examination Updates

2.1 Apportioning of kittiwake and gannet for East Anglia TWO

4. At Deadline 4 (REP4-042 and described below) the collision risk modelling (CRM) predictions for the East Anglia ONE North project were updated to include the windfarm site boundary revision and at the same time the revision of gannet and kittiwake apportioning to the FFC SPA using the full breeding season (as advised by NE). No updates were made to the East Anglia TWO figures (since the design was unchanged) so this resulted in continued use of the migration-free breeding season for the apportioned collisions for East Anglia TWO. This has now been corrected in this document.
5. For the avoidance of doubt the collision risk modelling itself is not affected (i.e. the EIA and CIA figures), the only change is the months which are treated as part of the breeding or non-breeding seasons, and hence what proportion of the total collisions in those months are apportioned to the FFC SPA populations. The changes for East Anglia TWO are provided in **Table 2** and incorporated in Appendix 1 (from previous use of migration free to current use of full breeding season):

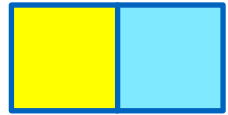
Table 2.1 Updates to the East Anglia TWO FFC SPA Apportioned Collision Estimates Following a Change from the Migration Free Breeding Season to the Full Breeding Season. Figures in parentheses represent the 95% confidence intervals

Species	Season	Spring	Breeding	Autumn	Total
Gannet	Full breeding season	0.2 (0.1-0.4)	12.5 (4.5-24.3)	1.1 (0.8-1.5)	13.8 (5.3-26.2)
	Migration free	0.1 (0-0.2)	10.7 (4.2-20.4)	1.3 (0.9-1.9)	12.1 (5.1-22.5)
Kittiwake	Full breeding season	0.5 (0.3-0.9)	0 (0-0)	0.3 (0.1-0.5)	0.8 (0.4-1.4)
	Migration free	1.3 (0.6-2.1)	0 (0-0)	0.4 (0.1-0.8)	1.7 (0.7-2.9)

2.2 Changes to the East Anglia ONE North boundary

6. At Deadline 4 updated collision risk estimates for East Anglia ONE North were provided (REP4-042). These were calculated following a revision to the site boundary (to achieve a 2km separation from the Outer Thames Estuary SPA) and resulting change to the estimated density of birds in flight. These calculations were only undertaken for the following species which did not have very low (≤ 3) predicted collision mortalities:

- Gannet;
- Kittiwake;



- Lesser Black-Backed Gull (LBBG), and
- Great Black-Backed Gull (GBBG).

7. Note that LBBG was included, even though the original collision risk estimates were very low, due to the potential connectivity with the Alde-Ore Estuary SPA. No further changes have been made to the East Anglia ONE North figures.

2.3 Increase of draught height

8. Following detailed design reviews, the minimum draught height for both East Anglia ONE North and East Anglia TWO has been increased by 2m, to 24m above MHWS. This increase in the minimum draught height reduces the collision risk estimates at the two windfarms by up to 15% in some cases (see REP1-047). No further changes have been made to the draught height and the collision risk estimates for the Projects have only changed with respect to the points considered in **section 2.1** and **section 2.2**.

2.4 In-combination totals

9. The Norfolk Boreas Deadline 8 collision risk estimates have been taken as the common position for all cumulative and in-combination projects (with changes to those totals noted in **sections 2.4.1** to **2.4.5** below). This therefore takes into account all post-application changes made to Norfolk Vanguard and Norfolk Boreas and includes the numbers submitted in the preliminary environmental information report (PEIR) for Hornsea Four. Predicted collisions at the Thanet Extension windfarm, which was refused consent in June 2020, were removed from consideration.

10. Given the continued uncertainty around the status of the estimates for some projects or the planning status of some projects, the Applicants have amended the in-combination tables presented previously (REP4-042).

2.4.1 Hornsea Three

11. Hornsea Project Three has provided the Applicants with a document containing updated collision risks for gannet, kittiwake, herring gull, lesser black-backed gull and great black-backed gull and displacement figures for guillemot, razorbill and gannet (Ørsted 2021). Following review of the additional collision modelling for kittiwake for Hornsea Project Three (Ørsted 2021), it was established that these have remained the same as those submitted in Ørsted (2019) and which were presented in the previous cumulative and in-combination assessments (REP8-035). Therefore, only a single set of collision figures are included for kittiwake for Hornsea Project Three. The kittiwake figures in this update are the same as those used by the Secretary of State in the Hornsea Three HRA, therefore it is assumed that the equivalent figures for the other species (calculated using the same windfarm design) are the most appropriate for use in the cumulative and in-



combination tables. However, as Natural England has not yet indicated their acceptance of these updated figures, they have been presented alongside those presented for Hornsea Project Three in previous submissions. Similarly, the summed totals account for the two alternative sets of collision estimates for that windfarm for all species except kittiwake.

12. It should also be noted that while Hornsea Project Three has been granted consent, this was on the basis that the project fully compensates for its contribution to the kittiwake in-combination total. Therefore, although kittiwake collision figures are presented for this windfarm, they have not been included in the in-combination total apportioned to the Flamborough and Filey Coast SPA.

2.4.2 Hornsea Four

13. The estimates provided for Hornsea Four remain those presented in that project's PEIR. It had been hoped that updated figures would be available, but there has been no updated information from Ørsted as the project has not yet submitted a DCO application.

2.4.3 Norfolk Vanguard

14. Following an Order of the High Court, the decision of the Secretary of State to grant the application by Norfolk Vanguard Limited for development consent for Norfolk Vanguard has been quashed. Natural England has advised that totals should be presented with and without Norfolk Vanguard as a result of this decision. There are no changes to the estimated collision from this project, but the numbers for the project have now been presented separately from the confirmed totals.

2.4.4 East Anglia THREE

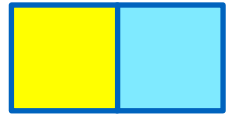
15. The East Anglia THREE windfarm recently had a non-material change granted¹, which included reduced collision estimates. These figures have been used in this update.

2.4.5 Dudgeon Extension Project and Sheringham Shoal Extension Project (DEP and SEP)

16. Since submission of REP8-035, the Preliminary Environmental Information (PEI) figures for DEP and SEP have become available² and so these figures have been used in this update.

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010056/EN010056-002489-210415%20Decision%20Letter%20-%20EA3%20NMC.pdf>

² <https://sepanddep.commonplace.is/proposals/11-peir-documentation>

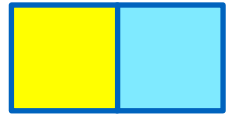


3 Updated cumulative and in-combination collisions

17. The cumulative and in-combination collision totals for gannet, kittiwake, herring gull, LBBG and GBBG include the changes outlined above in **section 1** and **2**.
18. The cumulative and in-combination totals are provided in **Appendix 1** Updated Cumulative and In-Combination Collision Risk and Displacement Tables. The cumulative and in-combination totals are presented as follows:

For each species the Applicants have included the following rows:

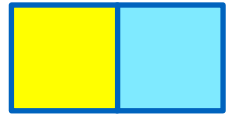
- **Total (all projects above)** – this includes all projects previously agreed at Deadline 8 of the Norfolk Boreas examination (which is the commonly agreed position) but *excludes* Norfolk Vanguard, Hornsea Project Three and Hornsea Project Four.
 - **Total with Norfolk Vanguard** – this is the ‘Total (all projects above)’ plus Norfolk Vanguard.
 - **Total with Hornsea Project Three – original / revised** – this is the ‘Total (all projects above)’ plus Hornsea Project Three, using either the estimates submitted during the Hornsea Project Three examination ‘original’ or the recently available ‘revised’ ones. Following review of the additional collision modelling for kittiwake for Hornsea Project Three (Orsted 2021), it was established that these have remained the same as those submitted in Orsted (2019) and which were presented in the previous cumulative and in-combination assessments (REP8-035). Therefore, only a single set of collision figures are included for kittiwake for Hornsea Project Three.
 - **Total with Hornsea Project Four** – this is the ‘Total (all projects above)’ plus Hornsea Project Four.
 - **Total with Dudgeon Extension Project (DEP) and Sheringham Shoal Extension Project (SEP)** – this is the ‘Total (all projects above)’ plus DEP and SEP.
 - **Total (all projects)** – this is the grand total for all the windfarms in the table with no projects excluded (i.e. Total (all projects above) plus Norfolk Vanguard, Hornsea Project Three, Hornsea Project Four and DEP and SEP).
19. The Examining Authority, Natural England and Secretary of State can therefore see the confirmed total (i.e. those numbers and projects for which there is



certainty) and incorporate the effects of the other projects as they see fit in their consideration of cumulative and in-combination effects.

4 Conclusion

20. Overall, the updates described within this cumulative and in-combination collision risk update do not alter the conclusions of negligible to minor adverse significance for the EIA and no Adverse Effects on Integrity for the HRA within the assessments submitted (**Chapter 12 Offshore Ornithology** (APP-060) and the **Information to Support Appropriate Assessment Report** (APP-043)).
21. Project-alone collision mortalities for both Projects are already small when compared to other projects of a similar scale. These numbers have been further reduced from those submitted with the Applications following the increase in draught height for the Projects.



5 References

Furness, R.W. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, Number 164.

Natural England (2019). Norfolk Boreas Offshore Wind Farm. Appendix 1 to the Relevant Representations of Natural England - Ornithology

Ørsted (2019) Hornsea Project Three Offshore Wind Farm. Appendix 28 to Deadline 4 submission -Summary of positions in relation to collision mortality for the SPA populations of gannet and kittiwake.

Ørsted (2021) Hornsea Three. Calculation of effect estimates.



Appendix 1 Updated Cumulative and In-Combination Collision Risk and Displacement Tables

Introduction

22. In this Deadline 11 update, the Applicants have included summary rows which include all projects previously agreed at Deadline 8 of the Norfolk Boreas examination (which is the commonly agreed position) minus Hornsea Project Three, Hornsea Project Four, Norfolk Vanguard and DEP and SEP. These later windfarms are then included individually and altogether in a grand total for all windfarms in the tables.

Collision Risk

Gannet

Table A0.1 Updated gannet cumulative and in-combination collision risk

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
1	Beatrice Demonstrator	0.6	0	0.9	0.04	0.7	0.05	2.2	0.1
1	Greater Gabbard	14	0	8.8	0.42	4.8	0.3	27.5	0.7
1	Gunfleet Sands	-	-	-	-	-	-	-	-
1	Kentish Flats	1.4	0	0.8	0.04	1.1	0.07	3.3	0.1
1	Kentish Flats Extension	-	-	-	-	-	-	-	-
1	Lincs	2.1	2.1	1.3	0.06	1.7	0.1	5	2.3
1	London Array	2.3	0	1.4	0.07	1.8	0.11	5.5	0.2
1	Lynn and Inner Dowsing	0.2	0.2	0.1	0.01	0.2	0.01	0.5	0.2
1	Scroby Sands	-	-	-	-	-	-	-	-



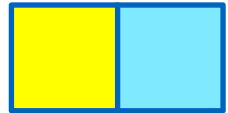
Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
1	Sheringham Shoal	14.1	14.1	3.5	0.17	0	0	17.6	14.3
1	Teesside	4.9	2.4	1.7	0.08	0	0	6.7	2.5
1	Thanet	1.1	0	0	0	0	0	1.1	0
1	Humber Gateway	1.9	1.9	1.1	0.05	1.5	0.09	4.5	2
1	Westermost Rough	0.2	0.2	0.1	0.01	0.2	0.01	0.5	0.2
1	Hywind	5.6	0	0.8	0.04	0.8	0.05	7.2	0.1
2	Kincardine	3	0	0	0	0	0	3	0
2	Beatrice	37.4	0	48.8	2.34	9.5	0.59	95.7	2.9
2	Dudgeon	22.3	22.3	38.9	1.87	19.1	1.18	80.3	25.3
2	Galloper	18.1	0	30.9	1.48	12.6	0.78	61.6	2.3
2	Race Bank	33.7	33.7	11.7	0.56	4.1	0.25	49.5	34.5
2	Rampion	36.2	0	63.5	3.05	2.1	0.13	101.8	3.2
2	Hornsea Project One	11.5	11.5	32	1.54	22.5	1.4	66	14.4
3	Blyth Demonstration Project	3.5	0	2.1	0.1	2.8	0.17	8.4	0.3
3	Dogger Bank Creyke Beck Projects A and B	81.1	40.6	83.5	4	54.4	3.4	219	47.9
3	East Anglia ONE	3.4	3.4	131	6.3	6.3	0.4	141	10.1
3	European Offshore Wind Deployment Centre	4.2	0	5.1	0.25	0.1	0	9.3	0.3
3	Firth of Forth Alpha and Bravo	800.8	0	49.3	2.37	65.8	4.08	915.9	6.4
3	Inch Cape	336.9	0	29.2	1.4	5.2	0.32	371.3	1.7
3	Methil	6	0	0	0	0	0	6	0
3	Moray Firth (EDA)	80.6	0	35.4	1.7	8.9	0.55	124.9	2.3



Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
3	Neart na Gaoithe	143	0	47	2.26	23	1.43	213	3.7
3	Dogger Bank Teesside Projects A and B	14.8	7.4	10.1	0.49	10.8	0.67	35.7	8.5
3	Triton Knoll	26.8	26.8	64.1	3.08	30.1	1.87	121	31.7
3	Hornsea Project Two	7	7	14	0.67	6	0.37	27	8
4	East Anglia THREE	4.8	4.8	28.5	1.4	8.4	0.5	41.8	6.7
6	Moray West	10	0	2	0.1	1	0.06	13	0.2
6	Norfolk Boreas	14.1	14.2	12.7	0.61	3.9	0.24	30.7	15.1
6	East Anglia TWO	12.5	12.5	23.1	1.1	4	0.2	39.6	13.8
6	East Anglia ONE North	12.4	12.4	11	0.52	1.1	0.07	24.5	13
	Total (all projects above)	1772.5	217.5	794.4	38.18	314.5	19.45	2881.6	275
5	<i>Norfolk Vanguard</i>	8.2	8.2	18.6	0.89	5.3	0.33	32.1	9.4
	Total with Norfolk Vanguard	1780.7	225.7	813	39.07	319.8	19.78	2913.7	284.4
5	<i>Hornsea Project Three - original³</i>	26	26	12	0.58	11	0.68	49	27.3
	<i>Hornsea Project Three - revised⁴</i>	10	6	5	0	4	0	19	7
	Total with Hornsea Project Three - original	1798.5	243.5	806.4	38.76	325.5	20.13	2930.6	302.3
	Total with Hornsea Project Three - revised	1782.5	223.5	799.4	38.18	318.5	19.45	2900.6	282

³ Figures for Hornsea Project Three taken from Ørsted (2019) following advice in Natural England (2019).

⁴ Figures for Hornsea Project Three taken from Ørsted (2021).



Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
6	<i>Hornsea 4 (PEIR)</i>	43.3	43.3	9.9	0.48	8.1	0.5	61.3	44.3
	Total with Hornsea 4	1815.8	260.8	804.3	38.66	322.6	19.95	2942.9	319.3
6	<i>DEP and SEP (PEIR)</i>	3.96	3.96	6.43	0.31	0.36	0.02	10.75	4.29
	Total with DEP and SEP	1776.46	221.46	800.83	38.49	314.86	19.47	2892.35	279.29
	Total (all projects, H3 original)	1853.96	298.96	841.33	40.44	339.26	20.98	3034.75	360.29
	Total (all projects, H3 revised)	1837.96	278.96	834.33	39.86	332.26	20.3	3004.75	339.99



Kittiwake

Table A0.2 Updated kittiwake cumulative and in-combination collision risk

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
1	Beatrice Demonstrator	0	0	2.1	0.1	1.7	0.1	3.8	0.2
1	Greater Gabbard	1.1	0	15	0.8	11.4	0.8	27.5	1.6
1	Gunfleet Sands	-	-	-	-	-	-	-	
1	Kentish Flats	0	0	0.9	0.1	0.7	0.1	1.6	0.1
1	Kentish Flats Extension	0	0	0	0	2.7	0.2	2.7	0.2
1	Lincs	0.7	0.7	1.2	0.1	0.7	0.1	2.6	0.8
1	London Array	1.4	0	2.3	0.1	1.8	0.1	5.5	0.3
1	Lynn and Inner Dowsing	-	-	-	-	-	-	-	
1	Scroby Sands	-	-	-	-	-	-	-	
1	Sheringham Shoal	-	-	-	-	-	-	-	
1	Teesside	38.4	0	24	1.3	2.5	0.2	64.9	1.5
1	Thanet	0.2	0	0.5	0	0.4	0	1.1	0.1
1	Humber Gateway	1.9	1.9	3.2	0.2	1.9	0.1	7	2.2
1	Westermost Rough	0.1	0.1	0.2	0	0.1	0	0.5	0.1
1	Hywind	16.6	0	0.9	0.1	0.9	0.1	18.3	0.1
2	Kincardine	22	0	9	0.5	1	0.1	32	0.6
2	Beatrice	94.7	0	10.7	0.6	39.8	2.9	145.2	3.5
2	Dudgeon	-	-	-	-	-	-	-	
2	Galloper	6.3	0	27.8	1.5	31.8	2.3	65.9	3.8
2	Race Bank	1.9	1.9	23.9	1.3	5.6	0.4	31.4	3.6
2	Rampion	54.4	0	37.4	2	29.7	2.1	121.5	4.2



Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
2	Hornsea Project One	44	36.5	55.9	3	20.9	1.5	120.8	41
3	Blyth Demonstration Project	1.7	0	2.3	0.1	1.4	0.1	5.4	0.2
3	Dogger Bank Creyke Beck Projects A and B	288.6	55.8	135	7.3	295.4	21.3	719	84.3
3	East Anglia ONE	1.8	0	160.4	8.7	46.8	3.4	209	12
3	European Offshore Wind Deployment Centre	11.8	0	5.8	0.3	1.1	0.1	18.7	0.4
3	Firth of Forth Alpha and Bravo	153.1	0	313.1	16.9	247.6	17.8	713.8	34.7
3	Inch Cape	13.1	0	224.8	12.1	63.5	4.6	301.4	16.7
3	Methil	0.4	0	0	0	0	0	0.4	0
3	Moray Firth (EDA)	43.6	0	2	0.1	19.3	1.4	64.9	1.5
3	Neart na Gaoithe	32.9	0	56.1	3	4.4	0.3	93.4	3.4
3	Dogger Bank Teesside Projects A and B	136.9	26.4	90.7	4.9	216.9	15.6	444.5	46.9
3	Triton Knoll	24.6	24.6	139	7.5	45.4	3.3	209	35.4
3	Hornsea Project Two	16	13.3	9	0.5	3	0.2	28	14
4	East Anglia THREE	4.9	0	56.6	3.1	30.7	2.2	92.3	5.3
6	Moray West	79	0	24	1.3	7	0.5	110	1.8
6	Norfolk Boreas	13.3	11.4	32.2	1.7	11.9	0.9	57.5	14
6	East Anglia TWO	29.5	0	5.4	0.3	7.4	0.5	42.3	0.8



Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
6	East Anglia ONE North	40.4	0	8.1	0.43	3.5	0.25	52	0.7
	Total (all projects above)	1175.3	172.6	1479.5	79.93	1158.9	83.55	3813.9	336
6	<i>Norfolk Vanguard</i>	21.8	18.7	16.4	0.9	19.3	1.4	57.5	21
	Total with Norfolk Vanguard	1197.1	191.3	1495.9	80.83	1178.2	84.95	3871.4	357
5	<i>Hornsea Project Three⁵</i>	77	72	38	2	8	1	123	0
	Total with Hornsea Project Three	1252.3	244.6	1517.5	81.93	1166.9	84.55	3936.9	336
6	<i>Hornsea 4 (PEIR)</i>	153.3	153.3	34.7	1.9	9.9	0.7	197.9	155.9
	Total with Hornsea 4	1328.6	325.9	1514.2	81.83	1168.8	84.25	4011.8	491.9
6	<i>DEP and SEP (PEIR)</i>	18.13	18.13	10.46	0.56	2.2	0.16	30.79	18.85
	Total with DEP and SEP	1193.43	190.73	1489.96	80.49	1161.1	83.71	3844.69	354.85
	Total (all projects, H3)	1445.53	434.73	1579.06	85.29	1198.3	86.81	4223.09	531.75

* Note that the contribution from Hornsea Project Three to the FFC SPA annual total has been removed on the assumption that these collisions will be fully compensated for by the project.

⁵ Figures for Hornsea Project Three taken from Ørsted (2021).



Lesser Black-Backed Gull

Table A0.3 Updated lesser black-backed gull cumulative and in-combination collision risk

Tier	Windfarm	Breeding season		Nonbreeding season		Annual	
		Total	AOE SPA	Total	AOE SPA	Total	AOE SPA (nonbreeding season apportioned plus breeding season for wind farms <141km)*
1	Beatrice Demonstrator	-	-	-	-	-	-
1	Greater Gabbard	12.4	8	49.6	2	62	10
1	Gunfleet Sands	1	0.3	0	0	1	0.3
1	Kentish Flats	-	-	-	-	-	-
1	Kentish Flats Extension	0.3	0.1	1.3	0.1	1.6	0.2
1	Lincs	1.7		6.8	0.3	8.5	0.3
1	London Array	-	-	-	-	-	-
1	Lynn and Inner Dowsing	-	-	-	-	-	-
1	Scroby Sands	-	-	-	-	-	-
1	Sheringham Shoal	1.7	0.3	6.6	0.3	8.3	0.6
1	Teesside	0	-	0	0	0	0
1	Thanet	3.2	1.4	12.8	0.5	16	1.9
1	Humber Gateway	0.3	-	1.1	0	1.4	0
1	Westermost Rough	0.1	-	0.3	0	0.4	0
1	Hywind	0	-	0	0	0	0
2	Kincardine	0	-	0	0	0	0
2	Beatrice	0	-	0	0	0	0
2	Dudgeon	7.7	1.1	30.6	1.2	38.3	2.3
2	Galloper	27.8	18	111	4.4	138.8	22.4



Tier Windfarm		Breeding season		Nonbreeding season		Annual	
		Total	AOE SPA	Total	AOE SPA	Total	AOE SPA (nonbreeding season apportioned plus breeding season for wind farms <141km)*
2	Race Bank	43.2	-	10.8	0.4	54	0.4
2	Rampion	1.6	-	6.3	0.3	7.9	0.3
2	Hornsea Project One	4.4	-	17.4	0.7	21.8	0.7
3	Blyth Demonstration Project	0	-	0	0	0	0
3	Dogger Bank Creyke Beck Projects A and B	2.6	-	10.4	0.4	13	0.4
3	East Anglia ONE	5.9	2.2	33.8	1.4	39.7	3.6
3	European Offshore Wind Deployment Centre	0	0	0	0	0	0
3	Firth of Forth Alpha and Bravo	2.1	-	8.4	0.3	10.5	0.3
3	Inch Cape	0	-	0	0	0	0
3	Methil	0.5	-	0	0	0.5	0
3	Moray Firth (EDA)	0	-	0	0	0	0
3	Near na Gaoithe	0.3	-	1.2	0	1.5	0
3	Dogger Bank Teesside Projects A and B	2.4	-	9.6	0.4	12	0.4
3	Triton Knoll	7.4	-	29.6	1.2	37	1.2
3	Hornsea Project Two	2	-	2	0.1	4	0.1
4	East Anglia THREE	5.4	1.3	3.1	0.1	8.5	1.4
6	Moray West	0		0	0	0	0
6	Norfolk Boreas	6.2	1.9	8.1	0.2	14.3	2.1
6	East Anglia TWO	4.2	1.6	0.5	0	4.7	1.6



Tier	Windfarm	Breeding season		Nonbreeding season		Annual	
		Total	AOE SPA	Total	AOE SPA	Total	AOE SPA (nonbreeding season apportioned plus breeding season for wind farms <141km)*
6	East Anglia ONE North	0.9	0.2	0.6	0.1	1.5	0.3
	Total (all projects above)	145.3	36.4	361.9	14.4	507.2	50.8
5	<i>Norfolk Vanguard</i>	8.4	2.5	3.6	0.1	12	2.6
	Total with Norfolk Vanguard	153.7	38.9	365.5	14.5	519.2	53.4
5	<i>Hornsea Project Three - original⁶</i>	17.3	0	0	0	17.3	0
5	<i>Hornsea Project Three - revised⁷</i>	8	0	1	0	9	0
	Total with Hornsea Project Three (original)	162.6	36.4	361.9	14.4	524.5	50.8
	Total with Hornsea Project Three (revised)	153.3	36.4	362.9	14.4	516.2	50.8
6	<i>Hornsea 4 (PEIR)</i>	1.9	0	0	0	1.9	0
	Total with Hornsea Project Four	147.2	36.4	361.9	14.4	509.1	50.8
6	<i>DEP and SEP (PEIR)</i>	0.85	0	0.28	0.0	1.13	0.0
	Total with DEP and SEP	146.2	36.4	362.2	14.4	508.3	50.8
	Total (all projects; Hornsea P3 original)	173.8	38.9	365.8	14.5	539.5	53.4
	Total (all projects; Hornsea P3 revised)	164.5	38.9	366.8	14.5	531.2	53.4

* The apportioning of lesser black-backed gull collisions to the Alde Ore Estuary SPA from breeding colonies in Norfolk and Suffolk uses the connectivity rates estimated in Table 1 of the **Cumulative and In-Combination Collision Risk Update** submitted at Deadline 1 (REP1-047).

⁶ Figures for Hornsea Project Three taken from Ørsted (2019) following advice in Natural England (2019).

⁷ Figures for Hornsea Project Three taken from Ørsted (2021).



Herring gull

Table A0.4 Herring gull cumulative collision risk

Tier	Windfarm	Breeding season	Nonbreeding season	Annual
1	Beatrice Demonstrator	0		0
1	Greater Gabbard	0		0
1	Gunfleet Sands	-	-	-
1	Kentish Flats	0	0	0
1	Kentish Flats Extension	0.5	1.7	2.2
1	Lincs	0		0
1	London Array	-	-	-
1	Lynn and Inner Dowsing	0		0
1	Scroby Sands	-	-	-
1	Sheringham Shoal	0		0
1	Teesside	8.7	34.5	43.2
1	Thanet	4.9	19.6	24.5
1	Humber Gateway	0.4	1.1	1.5
1	Westermost Rough	0.1	0	0.1
1	Hywind	0.6	7.8	8.4
2	Kincardine	1	0	1
2	Beatrice	49.4	197.4	246.8
2	Dudgeon	-	-	-
2	Galloper	27.2		27.2
2	Race Bank	0		0
2	Rampion	155		155
2	Hornsea Project One	2.9	11.6	14.5
3	Blyth Demonstration Project	0.5	2.2	2.7
3	Dogger Bank Creyke Beck Projects A and B	0		0
3	East Anglia ONE	0	19	19



Tier	Windfarm	Breeding season	Nonbreeding season	Annual
3	European Offshore Wind Deployment Centre	4.8		4.8
3	Firth of Forth Alpha and Bravo	10	21	31
3	Inch Cape	0	13.5	13.5
3	Methil	5.8	3.7	9.5
3	Moray Firth (EDA)	52		52
3	Nearr na Gaoithe	5	12.5	17.5
3	Dogger Bank Teesside Projects A and B	0		0
3	Triton Knoll	0		0
3	Hornsea Project Two	23.8		23.8
4	East Anglia THREE	0	21.4	21.4
6	Moray West	12	1	13
6	Norfolk Boreas	1.5	5.4	6.9
6	East Anglia TWO	0	0.5	0.5
6	East Anglia ONE North	0	0	0
	Total (all projects above)	366.1	373.9	740
6	<i>Norfolk Vanguard</i>	<i>0.4</i>	<i>7.1</i>	<i>7.5</i>
	Total with Norfolk Vanguard	366.5	381	747.5
5	<i>Hornsea Project Three - original⁸</i>	<i>1</i>	<i>8.3</i>	<i>9.3</i>
5	<i>Hornsea Project Three - revised⁹</i>	<i>1</i>	<i>4</i>	<i>5</i>
	Total with Hornsea Project Three - original	367.1	382.2	749.3
	Total with Hornsea Project Three - revised	367.1	377.9	745
6	<i>Hornsea 4 (PEIR)</i>	<i>1.8</i>	<i>0.8</i>	<i>2.6</i>
	Total with Hornsea 4	367.9	374.7	742.6
6	<i>DEP and SEP (PEIR)</i>	<i>0.25</i>	<i>0</i>	<i>0.25</i>

⁸ Figures for Hornsea Project Three taken from Ørsted (2019) following advice in Natural England (2019).

⁹ Figures for Hornsea Project Three taken from Ørsted (2021).



Tier	Windfarm	Breeding season	Nonbreeding season	Annual
	Total with DEP and SEP	366.35	373.9	740.25
	Total (all projects Hornsea P3 original)	369.55	390.1	759.65
	Total (all projects Hornsea P3 revised)	369.55	385.8	755.35



Great black-backed gull

Table A0.5 Great black-backed gull cumulative collision risk

Tier	Windfarm	Breeding season	Nonbreeding season	Annual
1	Beatrice Demonstrator	0	0	0
1	Greater Gabbard	15	60	75
1	Gunfleet Sands	-	-	-
1	Kentish Flats	-	-	-
1	Kentish Flats Extension	0.1	0.2	0.3
1	Lincs	0	0	0
1	London Array	-	-	-
1	Lynn and Inner Dowsing	0	0	0
1	Scroby Sands	-	-	-
1	Sheringham Shoal	0	0	0
1	Teesside	8.7	34.8	43.6
1	Thanet	0.1	0.4	0.5
1	Humber Gateway	1.3	5.1	6.3
1	Westermost Rough	0	0	0.1
1	Hywind	0.3	4.5	4.8
2	Kincardine	0	0	0
2	Beatrice	30.2	120.8	151
2	Dudgeon	0	0	0
2	Galloper	4.5	18	22.5
2	Race Bank	0	0	0
2	Rampion	5.2	20.8	26
2	Hornsea Project One	17.2	68.6	85.8
3	Blyth Demonstration Project	1.3	5.1	6.3
3	Dogger Bank Creyke Beck Projects A and B	5.8	23.3	29.1
3	East Anglia ONE	0	46	46



Tier	Windfarm	Breeding season	Nonbreeding season	Annual
3	European Offshore Wind Deployment Centre	0.6	2.4	3
3	Firth of Forth Alpha and Bravo	13.4	53.4	66.8
3	Inch Cape	0	36.8	36.8
3	Methil	0.8	0.8	1.6
3	Moray Firth (EDA)	9.5	25.5	35
3	Neart na Gaoithe	0.9	3.6	4.5
3	Dogger Bank Teesside Projects A and B	6.4	25.5	31.9
3	Triton Knoll	24.4	97.6	122
3	Hornsea Project Two	3	20	23
4	East Anglia THREE	4.1	30.3	34.4
6	Moray West	4	5	9
6	Norfolk Boreas	6.9	28.7	35.6
6	East Anglia TWO	3.5	3.4	6.9
6	East Anglia ONE North	3.7	1.2	5
	Total (all projects above)	170.9	741.8	912.8
6	<i>Norfolk Vanguard</i>	4.5	21.5	26
	Total with Norfolk Vanguard	175.4	763.3	938.8
5	<i>Hornsea Project Three - original¹⁰</i>	19.4	46.6	66
5	<i>Hornsea Project Three - revised¹¹</i>	8	28	36
	Total with Hornsea Project Three - original	190.3	788.4	978.8
	Total with Hornsea Project Three - revised	178.9	769.8	948.8
6	<i>Hornsea 4 (PEIR)</i>	3	13.6	13.6
	Total with Hornsea 4	173.9	755.4	926.4
6	<i>DEP and SEP (PEIR)</i>	6.82	0.3	7.12
	Total with DEP and SEP	177.72	742.1	919.92

¹⁰ Figures for Hornsea Project Three taken from Ørsted (2019) following advice in Natural England (2019).

¹¹ Figures for Hornsea Project Three taken from Ørsted (2021).



Tier	Windfarm	Breeding season	Nonbreeding season	Annual
	Total (all projects Hornsea P3 original)	204.62	823.8	1025.52
	Total (all projects Hornsea P3 revised)	193.22	805.2	995.52



Displacement

Guillemot

Table A0.6 Guillemot cumulative displacement risk

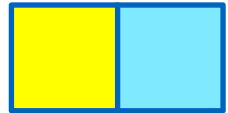
Windfarm	Breeding season		Nonbreeding season		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Beatrice Demonstrator	No estimate available					
Gunfleet Sands	0	0	363	16	363	16
Kentish Flats	0	0	3	0.1	3	0.1
Kentish Flats Extension	0	0	4	0.2	4	
Greater Gabbard	345	0	548	24.1	893	24.1
Lincs & LID	582	0	814	35.8	1396	35.8
London Array	192	0	377	16.6	569	16.6
Scroby Sands	No estimate available					
Sheringham Shoal	390	0	715	31.5	1105	31.5
Teesside	267	267	901	39.6	1168	306.6
Thanet	18	0	124	5.5	142	5.5
Humber Gateway	99	99	138	6.1	237	105.1
Westermost Rough	347	347	486	21.4	833	368.4
Hywind	249	0	2136	94	2385	94
Kincardine	632	0	0	0	632	0
Beatrice	13610	0	2755	121.2	16365	121.2
Dudgeon	334	0	542	23.8	876	23.8
Galloper	305	0	593	26.1	898	26.1
Race Bank	361	0	708	31.2	1069	31.2



Windfarm	Breeding season		Nonbreeding season		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Rampion	10887	0	15536	683.6	26423	683.6
Hornsea Project One	9836	4554.1	8097	356.3	17933	4910.4
Blyth Demonstration Project	1220	0	1321	58.1	2541	58.1
Dogger Bank Creyke Beck A	5407	1892.5	6142	270.2	11549	2162.7
Dogger Bank Creyke Beck B	9479	3317.7	10621	467.3	20100	3785
East Anglia ONE	274	0	640	28.2	914	28.2
European Offshore Wind Deployment Centre	547	0	225	9.9	772	9.9
Firth of Forth Alpha	13606	0	4688	206.3	18294	206.3
Firth of Forth Bravo	11118	0	4112	180.9	15230	180.9
Inch Cape	4371	0	3177	139.8	7548	139.8
Methil	25	0	0	0	25	0
Moray Firth (EDA)	9820	0	547	24.1	10367	24.1
Neart na Gaoithe	1755	0	3761	165.5	5516	165.5
Dogger Bank Teesside A	3283	1149.1	2268	99.8	5551	1248.9
Dogger Bank Teesside B	5211	1823.9	3701	162.8	8912	1986.7
Triton Knoll	425	425	746	32.8	1171	457.8



Windfarm	Breeding season		Nonbreeding season		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Hornsea Project Two	7735	3581.3	13164	579.2	20899	4160.5
East Anglia THREE	1744	0	2859	125.8	4603	125.8
Moray West	24426	0	38174	1679.7	62600	1679.7
Norfolk Boreas	7767	0	13777	606.2	21544	606.2
East Anglia TWO	2077	0	1675	73.7	3752	73.7
East Anglia ONE North	4183	0	1888	83.1	6071	83.1
Total (all projects)	152927	17456.6	148326	6526.5	301253	23982.9
<i>Norfolk Vanguard</i>	<i>4320</i>	<i>0</i>	<i>4776</i>	<i>210.2</i>	<i>9096</i>	<i>210.2</i>
Total with Norfolk Vanguard	157247	17456.6	153102	6736.7	310349	24193.1
<i>Hornsea Project Three - Original</i>	<i>13374</i>	<i>0</i>	<i>19174</i>	<i>843.7</i>	<i>32548</i>	<i>843.7</i>
<i>Hornsea Project Three - Revised</i>	<i>13374</i>	<i>8502</i>	<i>17772</i>	<i>782</i>	<i>31146</i>	<i>9284</i>
Total with Hornsea Project Three - original	166301	17456.6	167500	7370.2	333801	24826.6
Total with Hornsea Project Three - revised	166301	25958.6	166098	7308.5	332399	33266.9
<i>Hornsea 4 (PEIR)</i>	<i>15245</i>	<i>15245</i>	<i>69555</i>	<i>3060.4</i>	<i>84800</i>	<i>18305.4</i>



Windfarm	Breeding season		Nonbreeding season		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Total with Hornsea Project Four	168172	32701.6	217881	9586.9	386053	42288.3
<i>DEP and SEP (PEIR)</i>	<i>3576</i>	<i>0</i>	<i>8671</i>	<i>382</i>	<i>12247</i>	<i>382</i>
Total with DEP and SEP	156503	17456.6	156997	6908.5	313500	24364.9
Total (all projects, H3 original)	189442	32701.6	250502	11022.8	439944	43724.2
Total (all projects, H3 revised)	189442	41203.6	249100	10961.1	438542	52164.5



Razorbill

Table A0.7 Razorbill cumulative displacement risk

Windfarm	Breeding season		Autumn migration		Nonbreeding season		Spring migration		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Beatrice Demonstrator	No estimate available									
Gunfleet Sands	0	0	0	0	30	0.8	0	0	30	1
Kentish Flats	No estimate available									
Kentish Flats Extension	No estimate available									
Greater Gabbard	0	0	0	0	387	10.5	84	2.8	471	13
Lincs & LID	45	0	34	1.1	22	0.6	34	1.1	134	3
London Array	14	0	20	0.7	14	0.4	20	0.7	68	2
Scroby Sands	No estimate available									
Sheringham Shoal	106	0	1343	45.7	211	5.7	30	1	1690	52
Teesside	16	0	61	2.1	2	0.1	20	0.7	99	3
Thanet	3	0	0	0	14	0.4	21	0.7	37	1
Humber Gateway	27	0	20	0.7	13	0.4	20	0.7	80	2
Westermost Rough	91	91	121	4.1	152	4.1	91	3.1	455	102
Hywind	30	0	719	24.4	10	0.3			759	25
Kincardine	22	0		0		0			22	0
Beatrice	873	0	833	28.3	555	15	833	28.3	3094	72
Dudgeon	256	0	346	11.8	745	20.1	346	11.8	1693	44
Galloper	44	0	43	1.5	106	2.8	394	13.4	587	18



Windfarm	Breeding season		Autumn migration		Nonbreeding season		Spring migration		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Race Bank	28	0	42	1.4	28	0.8	42	1.4	140	4
Rampion	630	0	66	2.2	1244	33.6	3327	113.1	5267	149
Hornsea Project One	1109	534.5	4812	163.6	1518	41	1803	61.3	9242	800
Blyth Demonstration Project	121	0	91	3.1	61	1.6	91	3.1	364	8
Dogger Bank Creyke Beck A	1250	375	1576	53.6	1728	46.7	4149	141.1	8703	616
Dogger Bank Creyke Beck B	1538	461.4	2097	71.3	2143	57.9	5119	174	10897	765
East Anglia ONE	16	0	26	0.9	155	4.2	336	11.4	533	17
European Offshore Wind Deployment Centre	161	0	64	2.2	7	0.2	26	0.9	258	3
Firth of Forth Alpha	5876	0			1103	29.8			6979	30
Firth of Forth Bravo	3698	0			1272	34.3			4970	34
Inch Cape	1436	0	2870	97.6	651	17.6			4957	115
Methil	4	0	0	0	0	0	0	0	4	0
Moray Firth (EDA)	2423	0	1103	37.5	30	0.8	168	5.7	3724	44
Near na Gaoithe	331	0	5492	186.7	508	13.7			6331	200
Dogger Bank Teesside A	834	250.2	310	10.6	959	25.9	1919	65.2	4022	352



Windfarm	Breeding season		Autumn migration		Nonbreeding season		Spring migration		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Dogger Bank Teesside B	1153	345.9	592	20.1	1426	38.5	2953	100.4	6125	505
Triton Knoll	40	0	254	8.6	855	23.1	117	4	1265	36
Hornsea Project Two	2511	1210.3	4221	143.5	720	19.4	1668	56.7	9119	1430
East Anglia THREE	1807	0	1122	38.1	1499	40.5	1524	51.8	5952	130
Moray West	2808	0	3544	120.5	184	5	3585	121.9	10121	247
Norfolk Boreas	630	0	263	8.9	1065	28.8	345	11.7	2303	49
East Anglia TWO	281	0	44.1	1.5	136.4	3.7	230	7.8	692	13
East Anglia ONE North	403	0	85	2.9	54	1.5	207	7	749	11
Total (all projects)	30615	3268.3	32214.1	1095.2	19607.4	529.8	29502	1002.8	111936	5896
<i>Norfolk Vanguard</i>	879	0	866	29.5	839	22.7	924	31.4	3508	84
Total with Norfolk Vanguard	31494	3268.3	33080.1	1124.7	20446.4	552.5	30426	1034.2	115444	5980
<i>Hornsea Project Three - Original</i>	630	0	2020	68.7	5024	135.6	1754	59.6	9428	264
<i>Hornsea Project Three - Revised</i>	630	516	2020	69	3649	99	2105	72	8404	756
Total with Hornsea Project Three - original	31245	3268.3	34234.1	1163.9	24631.4	665.4	31256	1062.4	121364	6160



Windfarm	Breeding season		Autumn migration		Nonbreeding season		Spring migration		Annual	
	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
Total with Hornsea Project Three - revised	31245	3784.3	34234.1	1164.2	23256.4	628.8	31607	1074.8	120340	6652
<i>Hornsea 4 (PEIR)</i>	<i>580</i>	<i>580</i>	<i>5960</i>	<i>202.6</i>	<i>685</i>	<i>18.5</i>	<i>1361</i>	<i>46.3</i>	<i>8586</i>	<i>847.4</i>
Total with Hornsea Project Four	31195	3848.3	38174.1	1297.8	20292.4	548.3	30863	1049.1	120522	6743.4
<i>DEP and SEP (PEIR)</i>	<i>1064</i>	<i>0</i>	<i>4295</i>	<i>146</i>	<i>1310</i>	<i>35</i>	<i>420</i>	<i>14</i>	<i>7089</i>	<i>195</i>
Total with DEP and SEP	31679	3268.3	36509.1	1241.2	20917.4	564.8	29922	1016.8	119025	6091
Total (all projects, H3 original)	33768	3848.3	45355.1	1542	27465.4	741.6	33961	1154.1	140547	7286.4
Total (all projects, H3 revised)	33768	4364.3	45355.1	1542.3	26090.4	705	34312	1166.5	139523	7778.4



Gannet

Table A0.8 Gannet cumulative displacement risk

Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
1	Beatrice Demonstrator	-	-	-	-	-	-	-	-
1	Greater Gabbard	252	0	69	3.3	105	6.5	426	9.8
1	Gunfleet Sands	0	0	12	0.6	9	0.6	21	1.2
1	Kentish Flats	-	-	-	-	-	-	-	-
1	Kentish Flats Extension	0	0	13	0.6	0	0	13	0.6
1	Lincs	-	-	-	-	-	-	-	-
1	London Array	-	-	-	-	-	-	-	-
1	Scroby Sands	-	-	-	-	-	-	-	-
1	Sheringham Shoal	47	47	31	1.5	2	0.1	80	48.6
1	Teesside	1	0.5	0	0	0	0	1	0.5
1	Thanet	-	-	-	-	-	-	-	-
1	Humber Gateway	-	-	-	-	-	-	-	-
1	Westermost Rough	-	-	-	-	-	-	-	-
1	Hywind	10	0	0	0	4	0.2	14	0.2
1	Kincardine	120	0	0	0	0	0	120	0
2	Beatrice	151	0	0	0	0	0	151	0
2	Dudgeon	53	53	25	1.2	11	0.7	89	54.9
2	Galloper	360	0	907	43.5	276	17.1	1543	60.6
2	Race Bank	92	92	32	1.5	29	1.8	153	95.3
2	Rampion	0	0	590	28.3	0	0	590	28.3
2	Hornsea Project One	671	671	694	33.3	250	15.5	1615	719.8
2	Blyth Demonstration Project	-	-	-	-	-	-	-	-
3	Dogger Bank Creyke Beck Projects A and B	1155	577.5	2048	98.3	394	24.4	3597	700.2



Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
3	East Anglia ONE	161	161	3638	174.6	76	4.7	3875	340.3
3	European Offshore Wind Deployment Centre	35	0	5	0.2	0	0	40	0.2
3	Firth of Forth Alpha and Bravo	2956	0	664	31.9	332	20.6	3952	52.5
3	Inch Cape	2398	0	703	33.7	212	13.1	3313	46.8
3	Methil	23	0	0	0	0	0	23	0
3	Moray Firth (EDA)	564	0	292	14	27	1.7	883	15.7
3	Nearr na Gaoithe	1987	0	552	26.5	281	17.4	2820	43.9
3	Dogger Bank Teesside Projects A and B	2250	1125	887	42.6	464	28.8	3601	1196.4
3	Triton Knoll	211	211	15	0.7	24	1.5	250	213.2
3	Hornsea Project Two	457	457	1140	54.7	124	7.7	1721	519.4
3	East Anglia THREE	412	412	1269	60.9	524	32.5	2205	505.4
4	Moray West	2827	0	439	21.1	144	8.9	3410	30
6	Norfolk Boreas	1229	1229	1723	82.7	526	32.6	3478	1344.3
6	East Anglia TWO	192	192	891	42.8	192	11.9	1275	246.7
6	East Anglia ONE North	149	149	468	22.5	44	2.7	661	174.2
	Total (all projects above)	18763	5377	17107	821	4050	251	39920	6449
5	<i>Norfolk Vanguard</i>	271	271	2453	117.7	437	27.1	3161	415.8
	Total with Norfolk Vanguard	19034	5648	19560	938.7	4487	278.1	43081	6864.8
5	<i>Hornsea Project Three - Original</i>	1203	1203	1494	71.7	1099	68.1	3796	1342.8
	<i>Hornsea Project Three - Revised</i>	1333	844	984	47	527	33	2844	924



Tier	Wind farm	Breeding season		Autumn migration		Spring migration		Annual	
		Total	FFC SPA	Total	FFC SPA	Total	FFC SPA	Total	FFC SPA
	Total with Hornsea Project Three - original	19966	6580	18601	892.7	5149	319.1	43716	7791.8
	Total with Hornsea Project Three - revised	20096	6221	18091	868	4577	284	42764	7373
6	<i>Hornsea 4 (PEIR)</i>	<i>1892</i>	<i>1892</i>	<i>1192</i>	<i>57.2</i>	<i>659</i>	<i>40.9</i>	<i>3743</i>	<i>1990.1</i>
	Total with Hornsea 4	20655	7269	18299	878.2	4709	291.9	43663	8439.1
6	<i>DEP and SEP (PEIR)</i>	<i>401</i>	<i>401</i>	<i>638</i>	<i>30</i>	<i>47</i>	<i>3</i>	<i>1086</i>	<i>434</i>
	Total with DEP and SEP	19164	5778	17745	851	4097	254	41006	6883
	Total (all projects, H3 original)	22530	9144	22884	1097.6	6292	390.1	51706	10631.7
	Total (all projects, H3 revised)	22660	8785	22374	1072.9	5720	355	50754	10212.9