THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

NORFOLK BOREAS OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010087

Secretary of State Additional Information Request

Natural England's advice on the Flamborough and Filey Coast Special Protection Area (FFC SPA) in principle compensation measures

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20th August 2021

Annex 2 - Natural England's advice on the Flamborough and Filey Coast Special Protection Area (FFC SPA) in principle compensation measures

Our ref. point	Section/Point	Comment
2.1	1.1/2	We note that no information on compensatory measures for **gannet** were requested by the Secretary of State (SoS), nor have been provided in the additional information. Natural England's advice on the additional information is that we can now rule out an AEOI in-combination for all projects up to and including Hornsea Project 3 (i.e. all submitted projects). However, we are not in a position to rule out an AEOI in-combination when Hornsea Project 4 and Dudgeon & Sheringham Extensions are included. This is due to the uncertainty regarding the impacts for these pre-submission projects.
2.2	2.1/27	We refer the SoS to Natural England's published Evidence Statement: Natural England Evidence Statement Regarding Kittiwake Count Data Used to Classify the Flamborough Head & Bempton Cliffs SPA - EIN050
2.3	2.1/28	The Applicant has not provided the population size for the FFC SPA guillemot population at classification here. We advise this to be 41,607 pairs or 83,214 breeding adults.
2.4	2.1/29	The Applicant has not provided the population size for the FFC SPA razorbill population at classification here. We advise this to be 10,570 pairs or 21,140 breeding adults.
2.5	2.2/31	The targets for population abundance set out in Natural England's Supplementary Advice on Conservation Objectives for FFC SPA are as follows: • Kittiwake - restore the size of the breeding population at a level which is above 83,700 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. • Guillemot - maintain the size of the breeding population at a level which is above 41,607 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.

		• Razorbill - maintain the size of the breeding population at a level which is above 10,570 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent. Please note that the target is to maintain the guillemot and razorbill populations, rather than to restore them, as is the case for kittiwake.
2.6	3.1.1/36	Natural England takes a range-based approach to considering collision mortality impacts, given the associated uncertainties. The range of predicted impacts from Norfolk Boreas for FFC SPA kittiwake is between 4 and 28 – the agreed value of 14 quoted here is the central prediction. Natural England's advice is that this impact range will not result in an adverse effect on integrity (AEoI) from Norfolk Boreas alone. Natural England highlights that we have recently commissioned a report from British Trust for Ornithology (BTO) into the appropriate avoidance rates to use in Collision Risk Modelling, which was published on 20 August 2021: https://www.bto.org/our-science/publications/research-reports/additional-analysis-inform-sncb-recommendations-regarding **We advise that the SoS will need to have due regard of the implications of this on CRM prior to determination of this project and for other projects also in the planning system.** For kittiwake, the avoidance rate recommended in the BTO report is 98.74%, compared to the previous SNCB recommended avoidance rate of 98.9% (Cook et al, 2014). Natural England is likely to recommend the revised AR going forwards, which will result in an increased level of mortality to be predicted for this project. However, this is highly unlikely to result in an AEOI alone. Therefore, we advise that it would be appropriate for the Applicant to present updated CRM totals using this updated avoidance rate to provide a clear audit trail regarding the predicted impacts of the development, and to inform the scale of compensatory measures that may be needed. Natural England's initial calculations are that under these avoidance rates, the Norfolk Boreas alone figure would become 17 adult kittiwake collisions per annum (range 5 – 33)

2.7	3.1.2/44	Natural England's calculated in-combination totals are 533 for all projects, and 358 when Hornsea Project 4 and Dudgeon & Sheringham Extensions are excluded, based on the current SNCB recommended avoidance rate of 98.9%. The minor discrepancy between our totals and those of the Applicant are likely to relate to difference approaches to rounding.
2.8	3.1.2/48	The Applicant notes that the reduced project alone kittiwake collision predictions are lower than those for several consented offshore wind farms. We note that these are already consented and therefore represent an already increased level of anthropogenic mortality that the Norfolk Boreas project adds to. The assessment for Norfolk Boreas therefore needs to be in the context of this existing consented impact, which Natural England considers will result in an Adverse Effect on Integrity (AEoI). The relative contribution of Norfolk Boreas compared to these consented projects is therefore not relevant.
2.9	3.1.2/49	Natural England is not aligned with the Applicant's position in relation to headroom. We refer the SoS to our advice at Deadline 9 of the Norfolk Boreas examination[1], and our more recent advice at Deadlines 12 and 13 of the East Anglia 1N and 2 Examination[2, 3].
2.10	3.1.2/50	Natural England's advice is that an AEoI on the FFC SPA kittiwake population cannot be ruled out from Norfolk Boreas in-combination with other plans and projects, irrespective of whether Hornsea Project 4 and Dudgeon & Sheringham Extension are included or excluded. Natural England considers that the project makes a significant

[1] Natural England (2020) Norfolk Boreas Offshore Wind Farm Deadline 9: Natural England's Updated Ornithology Advice. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002099-EN010087_Boreas_D9_13_Updated%20Ornithology%20advice.pdf

[2] Natural England (2021) East Anglia One North/East Anglia Two Offshore Wind Farms Appendix A16c to the Natural England Deadline 12 Submission: Natural England's Comments on Offshore Ornithology Cumulative and In-Combination Collision Risk and Displacement Update [REP11-027]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010077/EN010077-005512-Natural%20England%20-%20Appendix%20A16c%20-%20NE%20Comments%20on%20Cumulative%20and%20In-Combination%20Collision%20Risk%20%5bREP11-027%5d%20Deadline%2012.pdf

[3] Natural England (2021) East Anglia One North/East Anglia Two Offshore Wind Farms Appendix A24 to the Natural England Deadline 13 Submission: Natural England's Summary Position and Final Advice to the Applicant's Deadline 12 Submissions Relating to Offshore Ornithology. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010077/EN010077-005638-EA1N%20Appendix%20A24%20-%20Natural%20England%20Summary%20Position%20and%20Final%20Advice%20to%20the%20Applicant's%20D12%20Submisssions%20Deadline%2013.pdf

		contribution to the FFC SPA in-combination total (14 out of 358 annual collision mortalities when Hornsea Project 4 and Dudgeon & Sheringham Extension are excluded, or 3.9% of that total, based on the current SNCB avoidance rate of 98.9%) We also advise that this contribution should be appraised in tandem with those of other submitted, but not determined projects, rather than discretely.
2.11	3.2.1/52	We welcome the presentation of the 95% upper and lower confidence limits from the FFC SPA guillemot displacement assessment. Natural England advises that the mortality values presented will not result in an AEOI alone.
2.12	3.2.2/57	Natural England concurs with the in-combination mortality range presented here for FFC SPA guillemot.
2.13	3.2.2/60	Natural England can now rule out an AEOI in-combination for all projects up to and including Hornsea Project 3 (i.e. all submitted projects) for FFC SPA guillemot. However, we are not in a position to rule out an AEOI in-combination when Hornsea Project 4 and Dudgeon & Sheringham Extensions are included, due to the uncertainty regarding the impacts for these pre-application projects, and with respect to the significant numbers of guillemot encountered in the Hornsea Project 4 array area.
2.14	3.3.1/62	We welcome the presentation of the 95% upper and lower confidence limits from the FFC SPA razorbill displacement assessment. Natural England advises that the mortality values presented will not result in an AEOI alone.
2.15	3.3.2/67	Natural England concurs with the in-combination mortality range presented here for FFC SPA razorbill.
2.16	3.2.2/70	Natural England can now rule out an AEOI in-combination for all projects up to and including Hornsea Project 3 (i.e. all submitted projects) for FFC SPA razorbill. However, we are not in a position to rule out an AEOI in-combination when Hornsea Project 4 and Dudgeon & Sheringham Extensions are included, due to the uncertainty regarding the impacts for these pre-submission projects, and with respect to the significant numbers of razorbill encountered in the Hornsea Project 4 array area.
4. COMPENSATION - KITTIWAKE		

2.17	4.1/74	Whilst it is correct to say that EC guidance provides some flexibility, compensating in a way that benefits the impacted designated site is a well-established principle in the provision of UK compensatory measures. Especially where there are uncertainties on the magnitude of the impacts and/or the recoverability.
2.18	4.3.1.4/101	We agree with the Applicant that improving sandeel availability to kittiwakes has significant ecological benefit/value as a long-term, strategic measure. Whilst there is currently no mechanism available for developers to adopt this as a compensatory measure, such a mechanism should not be discounted. We also consider that prey availability could form the basis of adaptive management measures for the compensatory measure in the longer term, which we consider should be incorporated into the proposals.
2.19	4.3.1.6/104 and 4.3.2.5/110.	We welcome the commitment by the Applicant that if initiatives are developed by the relevant authorities in the future with a view to enabling fishery management or to enabling fishery quotas to be purchased as means to deliver strategic compensation to be undertaken as strategic compensation they would be willing to participate in their delivery, on the basis that these were within acceptable timeframes for the Project.
2.20	4.4 - general	We agree with the Applicant that it is highly doubtful that predator control would significantly increase breeding success of kittiwake colonies to offset the predicted collision mortalities from the FFC SPA.
2.21	4.5.1/116	Whilst a letter of support from ABP is encouraging, Natural England highlights that the additional information does not include specific locations for the artificial nesting structures, only the broad location of the Port of Lowestoft. Natural England considers that in the absence of detailed information regarding location and design, and sufficient confidence that a specific land parcel has been secured, there is insufficient confidence that compensatory measures have been secured.
2.22	4.5.3/133	We welcome the Applicant's commitment to adaptive management. As noted above, Natural England considers that adaptive management should potentially extend to prey availability measures in the future.
2.23	4.5.3/136	We note the Applicant's intention to install the artificial nest structure prior to the 2022 breeding season, four breeding seasons in advance of offshore construction.

		Natural England advises that a similar condition as that used in the Hornsea Project 3 DCO should be incorporated into any Norfolk Boreas DCO, to ensure that the structures have produced kittiwakes of adult age by the time the development is operational. However, we highlight that given the port is currently planning to be under redevelopment for at least the next 18 months (Q1 2023) Natural England do not currently consider that an artificial structure would be likely to function as compensatory habitat until after the redevelopment has completed. Therefore, there is likely to be timeframe implications for the project.
2.24	4.5.3/137 and 138; also Figure 1, Table A1, Appendix 1	We welcome the Applicant's efforts to quantify the potential 'mortality debt' and the length of time it will take to 'pay back' that debt. To demonstrate the 'additionality' of the measure, colony size and productivity monitoring of the Lowestoft area will be needed to assess to what extent the new structure is increasing the number of nesting pairs and/or their breeding success, or simply causing a re-distribution of kittiwake in that locality. Colour-ringing of kittiwake nestlings would also help demonstrate the degree of interchange. Natural England has given detailed consideration to these calculations and concludes that there are some unduly optimistic assumptions in these calculations as follows: <u>1. Annual colony growth rate</u>: whilst it is stated in the table heading for Table A1 that various growth rates are considered, it appears that the Applicant has only used an annual colony growth rate of 20% for all of the scenarios. No evidence has been given for the use of a 20% growth rate, other than to state it is very modest. This growth rate may well be achieved or exceeded in the early years of the colony, but it is more doubtful whether this would be maintained in the later years. Furthermore, this growth rate would likely require large scale recruitment from an existing pool of non-breeders (or birds breeding poorly elsewhere already). If the colony were to grow at 20% per year and if, as envisaged, it were to produce an "excess" of 0.6 chicks per year to replenish the wider population, then as each year passes the colony growth becomes more heavily dependent on immigration rather than its own production. This would be because the difference between the increase per annum in the number of adults at the colony (which is

		growing by 20% each year) and the number of new adults that growing colony will produce each year will increase year on year. Natural England recognises the limited data available to predict the likely growth of the colony, however we do not consider that assuming a 20% growth rate for the colony for 30 years is precautionary, and would suggest that a 10% per annum growth rate would be more appropriate for the lifetime of the project. 2. Initial population size of artificial colony: the Applicant has considered initial population sizes for the artificial colony of 25 pairs, 50 pairs or 75 pairs. We note that Kidlaw et al. (2005) described the growth of colonies in Alaska and recorded that they are typically founded by variable numbers of pioneers (23 pairs on average). Coulson (2011) indicates that new colonies are usually formed by between 3 and 20 nesting pairs. It is also assumed that the 25/50/75 pairs would utilise the structure in the first breeding season once it is constructed. We consider that 50 and 75 pairs may not be realistic unless birds have been displaced from other nest sites, and that 5-10 pairs would be more precautionary values to base calculations on. 3. Excess productivity: the Applicant have used scenarios of 0.6 and 0.8 chicks per pair for 'excess productivity'. The 0.6 value is calculated from the productivity assumed for the artificial colony minus the FFC SPA KI productivity (i.e. 1.2-0.6=0.6 – see Table 4.2). It is not clear how the 0.6 value FFC SPA is derived. The assumption that productivity of the artificial colony will be 1.2 is based on the highest productivity rate for the existing artificial colonies reviewed by the Applicant during the Examination. We advised the Examination that this 1.2 productivity rate is overly optimistic [REP17-010] particularly over a 30-year period. Natural England concludes that there is insufficient justification for using an excess productivity rate of 0.6 alone and that it would have been more appropriate to consider a range of rates derived from productivity values from different studies to produce low, medium and high excess productivity values, with 0.6 likely to be at the higher end of the range. 4. Overall Conclusions: We therefore advise that the scenarios presented are insufficiently precautionary, and that the predicted 'cancelling' of the mortality debt is likely to take place later than has been predicted by the Applicant. This will be

		particularly the case in locations where other developers intend to erect artificial structures: Hornsea Project 3, Norfolk Vanguard, East Anglia 1N/2 have all considered the general Lowestoft area in their submission. We note that even under these optimistic calculations, the mortality debt would only be cancelled in 11-12 years. This further reinforces the need to secure early installation of the artificial nest site prior to turbine operation, and for the Secretary of State to secure this in the DCO in the same manner as for Hornsea Project 3. Please see our cover letter and comments on the DCO wording. Provision of more than one structure of different designs in different parts of the proposed location may help improve the likelihood of prompt colonisation, and we recommend this option to the Applicant.
2.25	4.5.3/139	The Applicant has provided some indicative measures to mitigate for the impacts of scheduled port redevelopment on the artificial nest structures. Whilst these mitigation measures would need to be location-specific, we are not aware of evidence to indicate that 50m buffer around all construction activity would be sufficient. We highlight that particular disturbance risks will arise from high or startling noise levels, such as that associated with impact piling. We welcome the reference to acoustic screening but recommend that at source noise reduction methods such as piling shrouds should also be considered, or if these are not feasible, seasonal restrictions for particular activities may be required. The planning application proposed to be submitted in October 2022 will need to demonstrate that appropriate mitigation is in place. Please see point 2.23.
2.26	4.5.3/142	Whilst we welcome the commitment to working collaboratively with Scottish Power Renewables, it is unclear how this will operate in practice. For example, how will increases in productivity be allocated to the different projects? Collaboration with the sister project Norfolk Vanguard would also be required should the re-determination of that project result in compensatory measures being sought, given that this project also proposes to erect an artificial nesting structure.
2.27	4.5.4/Table 4.2	Please see our detailed comments above regarding optimistic predictions regarding the scenarios used. For avoidance of doubt, the values in rows 1 and 2 appear in the column labelled *'Natural England's precautionary mean estimate'* due to formatting, and do not represent Natural England's position.

2.28	4.5.4/147	Please see Natural England's representation REP4-039 to the Boreas Examination, where we assess the Applicant's assertions regarding the level of precaution in our advice.
2.29	4.5.4/150	This analysis assumes that there are sufficient food supplies close to the colony that would obviate the need for kittiwakes to encounter the windfarms further offshore. We are not aware of any evidence indicating that this is the case.
2.30	4.5.5/153	It is indeed the case that several artificial structures have not successfully attracted kittiwake. We also highlight that none of the structures that have been occupied show evidence of 'full occupancy' i.e. there remain a significant proportion of nest spaces that are unoccupied. Therefore, it should in no way be assumed that because 300 nest sites have been provided, this will result in 300 nesting pairs.
2.31	4.5.5/158	As is noted by the Applicant, there is no evidence for colonisation rates from an artificial structure where there has not been an associated loss of a nesting site. However, this may be less important a factor regarding potential colonisation rates at Lowestoft, where nesting kittiwakes are regularly deterred from nesting on some residential and business premises. The additionality benefit here would relate to providing additional secure nesting sites that are not subject to this disturbance and are likely to result in increased productivity.
2.32	4.5.6.2/162	We welcome the Applicant's commitment to colour-ringing nestlings from the artificial structure, and to support colour-ring re-sighting efforts at FFC SPA. Given the size and limited visibility of the FFC SPA colony it will not be possible to quantify the extent of recruitment into FFC SPA from the artificial colony, however re-sighting observations could at least provide qualitative evidence of recruitment into FFC SPA.
2.33	4.5.6.2/163	We support ongoing monitoring of the Lowestoft colony, as this will provide important information regarding the extent to which the artificial nesting structure is providing an additional benefit i.e. increasing the overall population in the area, or simply redistributing it.
2.34	4.6.2/174	Natural England highlights that any delays to the proposed installation of the structure after February or any given year risks causing disturbance to kittiwakes returning to the general area during that breeding season

		(March onwards) and/or could deter prospecting birds from settling on the new structure. Therefore, unless monitoring clearly demonstrated otherwise, it wouldn't count as providing compensation during that year.
2.35	4.6.2.1/176	Natural England is concerned that the Project's DCO/dML only requires them to submit a compensation plan to the Secretary of State prior to the operation of any wind turbine. This means that there is no requirement for the compensation to be in place or functional prior to impact. Natural England considers this significantly reduces the confidence that the measures will be implemented to the timescales set out. Please see our cover letter and comments on the DCO wording for more detail.
2.36	4.6.3/177	**We are pleased that the Applicant will use the list of key compensatory matters given here, as it was developed by Natural England. However, Natural England notes that this list was compiled with a view to informing submission of appropriately well-developed compensatory measures into the Examination (or as is the case with current projects, prior to determination), rather than to inform the development of compensatory measures in the post-consent period. It is Natural England's view that sufficient clarify on all these matters is needed prior to determination.** **Natural England's appraisal of the proposed measures against the checklist is provided in Annex 5.**
5. COMPENSATION - GUILLEMOT		
2.37	5.1/184	Whilst it is correct to say that EC guidance provides some flexibility, compensating in a way that benefits the impacted designated site is a well-established principle in the provision of UK compensatory measures. Especially, for projects where uncertainties remain.
2.38	5.1/187 – 190	Natural England can now rule out an AEoI to FFC SPA guillemot from in-combination displacement for all submitted projects. However, we are not able to rule out an AEoI for all projects when Hornsea Project 4 and Dudgeon & Sheringham Extension projects are included in the in-combination total. This due to the uncertainty regarding the impacts for these pre-submission projects, and with respect to the significant numbers of guillemot encountered in the Hornsea Project 4 array area. Natural England's advice during the Examination was that for those projects falling within the scope of the in-combination assessment at that time i.e. submitted projects up to and including Hornsea Project 3, the mortality rate for displaced birds would be unlikely to be at the top of the range advised of 1-10%. This is because the

		majority of the projects that were scoped into the assessment lie in areas of the North Sea that represent low to medium levels of guillemot density during both the breeding (where relevant) and non-breeding seasons (Seabird Sensitivity Mapping Tool). It is therefore assumed that areas of low/medium density will be less important/desirable feeding areas and therefore mortality impacts of displacement from lower quality areas would be lower than displacement from optimal/important areas. Therefore, we do not anticipate that mortality rates to be at the top of the range considered for projects such as Norfolk Boreas with low/medium densities. However, this advice is specific to those projects and should not be taken as Natural England's standard advice for all proposals, as some projects will lie in areas of higher guillemot density. Neither should this be interpreted as Natural England resting exclusively on specific values when coming to integrity judgements. The Applicant has sought several times to misrepresent Natural England's advice on this matter. It is not the case, as the Applicant implies, that our assessment of in-combination impacts is based on values of 60-70% displacement and 1-2% mortality. It is also inaccurate to state that *'Natural England has stressed to the Applicant that these estimates should not be applied to future projects'*, which implies a shift or update in our advice. We are not providing different advice for future projects, but continue to provide advice on the basis that different projects will have different levels of sensitivity depending on densities of birds present.
2.39	5.1/191	Natural England did not agree with the conclusions of 50% displacement and 1% mortality from the MacArthur Green (2019) auk displacement review. Our detailed advice regarding this can be found in our Deadline 3 response to the Norfolk Vanguard Examination[4]
2.40	5.1/193	Please see comment on 2.1/28 above.
2.41	5.3.1.3/211	As has been done with FFC SPA kittiwake; Natural England considers that compensatory measures should target the 95% upper confidence limit value in order to provide confidence that impacts will be offset. In this instance, that would mean 61 rather than 42 guillemot mortalities per annum.

[4] Natural England (2019) Norfolk Vanguard Offshore Wind Farm: Natural England's comments on Appendix 3.3 – Operational Auk and Gannet Displacement: update and clarification [REP1-008]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002568-DL3%20-%20Natural%20England%20-%20Deadline%203%20Submission.pdf (see pages 20-26/90).

2.42	5.3.1.4/215	We agree with the Applicant that improving sandeel availability to guillemot has significant value as a long-term, strategic measure. Whilst there is currently no mechanism available for developers to adopt this as a compensatory measure, such a mechanism should not be discounted.
2.43	5.3.1.6/218	We welcome the commitment by the Applicant that if initiatives are developed by the relevant authorities in the future with a view to enabling fishery management or to enabling fishery quotas to be purchased as means to deliver strategic compensation to be undertaken as strategic compensation they would be willing to participate in their delivery, on the basis that these were within acceptable timeframes for the Project.
2.44	5.4.1/219	We agree that rat eradication is not a relevant option at the FFC SPA. Furthermore, if any sites can be identified where rats are affecting guillemot productivity, we note that these are likely to be remote to FFC SPA, because other English North Sea auk colonies are not known to be experiencing significant predation issues either. Therefore, it is unlikely that this compensatory measure would directly benefit the impacted SPA, but instead would provide benefits to the wider biogeographic or UK populations.
2.45	5.4.1/220	Predation by rats is not likely to be the key population driver for guillemot or razorbill colonies. We acknowledge there is some evidence from Lundy that in certain locations rat eradication may lead to increased productivity, increases in the numbers of occupied nest sites and/or recolonisation of areas. However, given other potentially more important population drivers such as prey availability and climate change, the results will be highly specific to the location chosen, and therefore potential locations where meaningful increases in productivity could be achieve need to be identified.
2.46	5.4.3/223	Natural England is concerned that it has not been demonstrated that there are any islands where invasive mammal eradications would benefit guillemot, as opposed to seabirds in general. Whilst potential candidate sites have been identified where invasive mammal eradication could benefit some seabird species, these have not been appraised for their suitability to deliver benefits for guillemot. The vast majority of guillemot nest on sheer cliffs where rat predation is very unlikely to be an issue; however, in some locations guillemot also nest in boulder fields. A potentially suitable site would be in an area where guillemot are known to nest in boulder fields and where rats are likely to be affecting guillemot productivity, either by direct predation of eggs/chicks or by deterring guillemot from nesting in locations where they might otherwise have nested.

		Without this core requirement being demonstrated, it is difficult to provide any confidence to the Secretary of State that an island eradication could be a viable compensatory measure for this species.
2.47	5.4.3/224	Natural England does not consider it appropriate to leave matters that have profound implications for the effectiveness of compensatory measures to the post-consent period and reiterates its concern regarding the lack of demonstration that a suitable island exists.
2.48	5.5.1/2129	Successful invasive mammal eradication projects have carried out significant amounts of community consultation prior to delivery, sometimes over several years. However, this important aspect does not seem to have been factored into the Applicant's timescales.
2.49	5.5.2.1/230	We support the ongoing use of traps/baits to determine whether the island in question remains rat-free. It is unclear though what action would be taken if rats have been found to recolonise the island; Natural England anticipates that a further eradication attempt would be made, but this would need clarifying in the compensation plan.
2.50	5.6/237	We agree that there are potential synergies, should a suitable island be identified where rats were thought to be impacting on the productivity of both guillemot and razorbill. We note that razorbill are more inclined to nest in boulder fields, and therefore more likely to benefit from rat eradication than guillemot.
2.51	5.7/238	Natural England highlights that the proposed DCO wording only requires a strategy to be submitted to the SoS in advance of first operation, meaning that the compensation would not be implemented until after the displacement mortality starts to occur. Natural England considers that wherever possible, compensatory measures should be in place prior to the impacts arising.
2.52	5.8/239	Again, we are pleased that the Applicant will use the list of key matters given here, but please see our comments on 4.6.3/177 above. **As with kittiwake, Natural England's appraisal of the proposed measures against the checklist is provided in Annex 5.**
6. COMPENSATION - RAZORBILL		
2.53	6.1/245	Whilst it is correct to say that EC guidance provides some flexibility, compensating in a way that benefits the impacted site is a well-established principle in the provision of UK compensatory measures.
2.54	6.1/248 – 251	Natural England can now rule out an AEoI to FFC SPA razorbill from in-combination displacement for all submitted projects. However, we are not able to rule out an AEoI for all projects when Hornsea Project 4 and Dudgeon & Sheringham Extension projects are included in the in-combination total. This due to the uncertainty regarding the impacts for these pre-submission projects, and with respect to the significant numbers of razorbill encountered in the Hornsea Project 4 array area.

		Natural England's advice during the Examination was that for those projects falling within the scope of the in-combination assessment at that time i.e. submitted projects up to and including Hornsea Project 3, the mortality rate for displaced birds would be unlikely to be at the top of the range advised of 1-10%. This is because the majority of the projects that were scoped into the assessment lie in areas of the North Sea that represent low to medium levels of razorbill density during both the breeding (where relevant) and non-breeding seasons (Seabird Sensitivity Mapping Tool). It is therefore assumed that areas of low/medium density will be less important/desirable feeding areas and therefore mortality impacts of displacement from lower quality areas would be lower than displacement from optimal/important areas. Therefore, we do not anticipate that mortality rates to be at the top of the range considered for projects such as Norfolk Boreas with low/medium densities. However, this advice is specific to those projects and should not be taken as Natural England's standard advice for all proposals, as some projects will lie in areas of higher razorbill density. Neither should this be interpreted as Natural England resting exclusively on specific values when coming to integrity judgements. The Applicant has sought several times to misrepresent Natural England's advice on this matter. It is not the case, as the Applicant implies, that our assessment of in-combination impacts is based on values of 60-70% displacement and 1-2% mortality. It is also inaccurate to state that *'Natural England has stressed to the Applicant that these estimates should not be applied to future projects'*, which implies a shift or update in our advice. We are not providing different advice for future projects, but continue to provide advice on the basis that different projects will have different levels of sensitivity depending on densities of birds present.
2.55	6.1/252	Natural England did not agree with the conclusions of 50% displacement and 1% mortality from the MacArthur Green (2019) auk displacement review. Our detailed advice regarding this can be found in our Deadline 3 response to the Norfolk Vanguard Examination[5]
2.56	6.1/254	Please see comment 2.1/29 above.
2.57	6.3.1.3/268	Natural England considers that compensatory measures should target the 95% upper confidence limit value in order to provide confidence that impacts will be offset. In this instance, that would mean compensation is needed for 6 rather than 4 razorbill mortalities per annum.

[5] Natural England (2019) Norfolk Vanguard Offshore Wind Farm: Natural England's comments on Appendix 3.3 – Operational Auk and Gannet Displacement: update and clarification [REP1-008]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002568-DL3%20-%20Natural%20England%20-%20Deadline%203%20Submission.pdf (see pages 20-26/90).

2.58	6.3.1.3/269	We agree with the Applicant that improving sandeel availability to razorbill has significant value as a long-term, strategic measure. Whilst there is currently no mechanism available for developers to adopt this as a compensatory measure, such a mechanism may appear in future.
2.59	6.3.1.6/275	We welcome the commitment by the Applicant that if initiatives are developed by the relevant authorities in the future with a view to enabling fishery management or to enabling fishery quotas to be purchased as means to deliver strategic compensation to be undertaken as strategic compensation they would be willing to participate in their delivery, on the basis that these were within acceptable timeframes for the Project.
2.60	6.4.1/276	We agree that rat eradication is not a relevant option at the FFC SPA. Furthermore, if any sites can be identified where rats are affecting razorbill productivity, we note that these are likely to be remote to FFC SPA, because other English North Sea auk colonies are not known to be experiencing significant predation issues either. Therefore, this compensatory measure is unlikely to directly benefit the impacted SPA, but instead would provide benefits to the wider biogeographic population.
2.61	6.4.1/277	Predation by rats is not likely to be the key population driver for guillemot or razorbill colonies. We acknowledge there is some evidence from Lundy that in certain locations rat eradication may lead to increased productivity, increases in the numbers of occupied nest sites and/or recolonisation of areas. However, given other potentially more important population drivers such as prey availability and climate change, the results will be highly specific to the location chosen, and therefore potential locations where meaningful increases in productivity could be achieve need to be identified.
2.62	6.4.3/280	Natural England is concerned that it has not been demonstrated that there are any islands where invasive mammal eradications would benefit razorbill, as opposed to seabirds in general. Whilst potential candidate sites have been identified where invasive mammal eradication could benefit some seabird species, these have not been appraised for their suitability to deliver benefits for razorbill. A potentially suitable site would be in an area where razorbill are known to nest in boulder fields and where rats are likely to be affecting razorbill productivity, either by direct predation of eggs/chicks or by deterring razorbill from nesting in locations where they might otherwise have nested. Without this core requirement being demonstrated, it is difficult to provide any confidence to the Secretary of State that an island eradication could be a viable compensatory measure for this species.

2.63	6.4.3/281	Natural England does not consider it appropriate to leave matters that have profound implications for the effectiveness of compensatory measures to the post-consent period and reiterates its concern regarding the lack of demonstration that a suitable island exists.
2.64	6.5.1/286	Successful invasive mammal eradication projects have carried out significant amounts of community consultation prior to delivery, sometimes over several years. However, this important aspect does not seem to have been factored into the Applicant's timescales.
2.65	6.5.2.1/287	We support the ongoing use of traps/baits to determine whether the island in question remains rat-free. It is unclear though what action would be taken if rats have been found to recolonise the island; Natural England anticipates that a further eradication attempt would be made, but this would need clarifying in the compensation plan.
2.66	6.6/294	We agree that there are potential synergies, should a suitable island be identified where rats were thought to be impacting on the productivity of both guillemot and razorbill. We note that razorbill are more inclined to nest in boulder fields, and therefore more likely to benefit from rat eradication than guillemot.
2.67	6.7/296	Natural England highlights that the proposed DCO wording only requires a strategy to be submitted to the SoS in advance of first operation, meaning that the compensation would not be implemented until after the displacement mortality starts to occur. Natural England considers that wherever possible, compensatory measures should be in place prior to the impacts arising.
2.68	6.8/297	Again, we are pleased that the Applicant will use the list of key matters given here, but please see our comments on 4.6.3/177 above. **As with kittiwake, Natural England's appraisal of the proposed measures against the checklist is provided in Annex 5.**
10	**FFC SPA UPDATED CUMULATIVE AND IN-COMBINATION COLLISION AND DISPLACEMENT ESTIMATES**	

<table>
<tr><td>2.69</td><td>Table 10.1 – gannet collision</td><td>Natural England agrees with all the totals presented here.</td></tr>
<tr><td>2.70</td><td>Table 10.2 – kittiwake collision</td><td>See comment 3.1.2/44 above.</td></tr>
<tr><td>2.71</td><td>Table 10.3 – gannet displacement</td><td>Natural England highlights some minor differences between the Applicant’s in-combination totals for gannet and ours:

<table><tr><th></th><th>Applicant</th><th>Natural England</th></tr><tr><td>Hornsea 3 – total</td><td>2843</td><td>2841</td></tr><tr><td>Hornsea 4 and Dudgeon and Sheringham Extension excluded - total</td><td>50571</td><td>50568</td></tr></table>
These do not affect Natural England’s advice.</td></tr>
<tr><td>2.72</td><td>Table 10.4 – guillemot displacement</td><td>Natural England highlights a minor difference between the Applicant’s in-combination totals for guillemot and ours:

<table><tr><th></th><th>Applicant</th><th>Natural England</th></tr><tr><td>All projects – FFC SPA</td><td>43663</td><td>43662</td></tr></table>
This does not affect Natural England’s advice.</td></tr>
<tr><td>2.73</td><td>Table 10.5 – razorbill displacement</td><td>Natural England highlights some minor differences between the Applicant’s in-combination totals for razorbill and ours:

<table><tr><th></th><th>Applicant</th><th>Natural England</th></tr><tr><td>All projects – total</td><td>139523</td><td>139527</td></tr></table></td></tr>
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<tr><td>All projects – FFC SPA</td><td>7262</td><td>7261</td></tr>
<tr><td>Hornsea 4 and Dudgeon and Sheringham Extension excluded - total</td><td>123848</td><td>123852</td></tr>
<tr><td>Hornsea 4 and Dudgeon and Sheringham Extension excluded – FFC SPA</td><td>6220</td><td>6218</td></tr>
</table>

These do not affect Natural England’s advice.
</td></tr>
<tr><td colspan="3">Appendix 1 – Modelled colony production of adults against accumulated collision mortality</td></tr>
<tr><td>2.74</td><td>Table A.1</td><td>Natural England considers that the scenarios presented are likely to be unduly optimistic. Please see our detailed comments above at 4.5.3/137 and 138 for more information.</td></tr>
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