THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

East Anglia TWO Offshore Windfarm

Appendix A3 to the Natural England Deadline 1 Submission

Comments to Appendix 4: Offshore Ornithology Precaution Note [AS-041]

For:

The construction and operation of East Anglia Two Offshore Windfarm, a 900MW windfarm which could consist of up to 75 turbines, generators and associated infrastructure, located 37km from Lowestoft and 32km from Southwold.

Planning Inspectorate Reference: EN010078

2nd November 2020

Appendix A3 Natural England's response to East Anglia TWO and East Anglia ONE North Offshore Windfarms Applicant's Comments on Relevant Representations Appendix 4 Offshore Ornithology Precaution Note [AS-041]. Please note this Appendix is also in response to ExA Question 1.2.19.

This document is applicable to both the East Anglia ONE North and East Anglia TWO applications, and therefore is endorsed with the yellow and blue icon used to identify materially identical documentation in accordance with the Examining Authority's (ExA) procedural decisions on document management of 23rd December 2019. Whilst for completeness of the record this document has been submitted to both Examinations, if it is read for one project submission there is no need to read it again for the other project.

We note that Appendix 4 is similar to previous documents which have been submitted during the Norfolk Vanguard and Norfolk Boreas Examination. Therefore many of the responses we made to those documents are repeated here.

Sources of uncertainty (survey data)

1. As noted in our Deadline 9 response during the Norfolk Vanguard examination[1] and in our Deadline 4 response during the Norfolk Boreas examination[2], the distribution of birds in the marine environment appears to be highly variable between days, seasons and years. It is likely that e.g. 24 days of surveys over 2 years - approximately 3.3% of the total number of 720 days - do not fully capture the full extent of variation density/abundance of seabirds that can be present within the survey areas during the 2 year period, including low as well as high counts, let alone over the 30-year period of the lifespan of the project. In that context, if uncertainty in an offshore ornithology survey dataset is to be properly addressed, it is entirely appropriate for the Applicant to present values from both lower and upper 95% confidence limits for consideration, bearing in mind that Natural England takes – and has consistently advocated - a range-based approach. This is the case for both collision risk assessments and displacement assessments.

[1] Natural England (2019) Natural England's comments on Deadline 8 submission – Offshore Ornithology Precaution in ornithological assessment for offshore wind farms [REP8-067]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-003190-DL9%20-%20Natural%20England%20-%20Deadline%20Submission.pdf

[2] Natural England (2019) Norfolk Boreas Offshore Wind Farm – Pre 22nd January 2020 Issue Specific Hearing Advice: Updated Ornithology Advice. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-001592-DL4%20-%20Natural%20England%20-%20Ornithology%20Advice.pdf

2. The Applicant asserts that in our advice *'there is a tendency to focus on the upper 95% CIs of baseline data to ensure precaution'*. This is inaccurate. As noted in our Deadline 9 response during the Norfolk Vanguard examination[1], upper confidence limits are indeed considered in our advice, including as the most robust method to rule out significant impacts e.g. where 1% of baseline mortality is not even exceeded at the upper limits of predicted impacts, but this is quite different from an exclusive focus on upper confidence limits.

Collision risk modelling (CRM)

3. We acknowledge the Applicant's comments regarding the stochastic CRM (sCRM) allowing the full uncertainty to be captured in a more appropriate manner than the approach the Applicant has currently taken, which is to run the deterministic Band model multiple times and varying each input parameter individually (as advised by NE). We hope in the future to recommend the use of the full sCRM. However, due to the issues identified by the Applicant's consultant regarding how flight height data are treated in the sCRM and in the deterministic Band model, and until the Statutory Nature Conservation Bodies (SNCBs) have established what we will advise on key parameters including avoidance rate for use with the stochastic model, our advice currently is that deterministic, rather than stochastic, collision models are run. Multiple runs of the deterministic model with varied inputs does provide some measure of the variability in the input data.

Precaution in CRM avoidance rates

4. The Applicant notes that there is evidence (e.g. Bowgen & Cook 2018; Skov et al. 2018) that for some species the currently advised avoidance rates are too low. Natural England note that the SNCBs are currently reviewing the evidence on avoidance rates presented in the recently published Bowgen & Cook (2018), and its applicability to SNCB advice on CRM. This work is ongoing. Therefore Natural England's position remains that the appropriate avoidance rates to use with Band (2012) model are those set out in the SNCB guidance note JNCC et al. (2014), i.e. 98.9% for gannet and kittiwake with the 'Basic' Band model (i.e. Options 1 and 2), noting that the applicant has presented outputs using Natural England's preferred avoidance rates as well as those of the Applicant.

5. The Applicant also notes the work undertaken by APEM (2014) on gannet avoidance rates. As noted in Natural England's Relevant Representations at Norfolk Vanguard[3], the work

[3] Natural England (2018) Norfolk Vanguard Wind Farm Relevant Representations of Natural England. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-

undertaken by APEM at Greater Gabbard suggest gannet avoidance rate may be even higher than 0.989. Accordingly Natural England acknowledges the findings in APEM (2014) that use of the 0.989 avoidance rate for the basic Band model may overestimate collision predictions. As noted above, the SNCBs are reviewing the evidence on avoidance rates in Bowgen & Cook (2018). In the meantime, presenting for consideration outputs using Natural England's preferred avoidance rates for gannet as well as those of the Applicant is reasonable.

Nocturnal activity factors (NAFs)

6. The Applicant refers to nocturnal activity factors used in the assessments as being overestimates. As we have noted previously during the Norfolk Vanguard examination (see our Relevant[3] and Written Representations – Annex B[4], our Deadline 2[5] and Deadline 8[6] submissions for this examination) and in our Deadline 4 response during the Norfolk Boreas examination[2], we recognise that from recent evidence presented e.g. by MacArthur Green (2015) and Furness et al. (2018), nocturnal activity levels relative to daytime levels for some species may be lower than the levels that equate to the nocturnal activity factors currently used in CRM. However this does not necessarily translate into an over assessment of nocturnal collision risk, because of the way that densities of birds derived from baseline digital aerial surveys may not reflect diurnal activity patterns as measured by tagging studies.

7. Our position regarding nocturnal activity rates/factors position remains unchanged from that set out during the Norfolk Vanguard and Norfolk Boreas examinations, which includes

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[4] Natural England (2019) Norfolk Vanguard Offshore Wind Farm – Annex B: Natural England detailed advice on offshore ornithology. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002320-Natural%20England%20-%20Annex%20A-G%20Responses.pdf

[5] Natural England (2019) Norfolk Vanguard Offshore Wind Farm – Comments on Offshore Ornithological Aspects of Applicant's Response to Section 51 Advice from the Planning Inspectorate [AS-006]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-002461-Natural%20England%20-%20NE%20detailed%20comments%20on%20Offshore%20Ornithology%20S51%20Advice.pdf

[6] Natural England (2019) Norfolk Vanguard Offshore Wind Farm – Natural England's Comments on Norfolk Vanguard Ltd. Deadline 7 and Deadline 7.5 submissions in relation to Offshore Ornithology Related Matters and Schedule of Natural England's response to Examining Authority Rule 17 requests for further information or written comments. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-003121-DL8%20-%20Natural%20England%20-%20Deadline%20Submission.pdf

that offshore survey periods will have missed the periods of peak activity around dawn and dusk, which means it is not appropriate to apply 'empirically derived' nocturnal activity rates from tracking studies to offshore survey recorded results. Additionally, Natural England considers that it is not appropriate to simply adjust the CRM figures for the other OWFs included in the cumulative assessments to account for a change in nocturnal activity rate without re-running the CRM, as the modelling calculates the reduction in activity at night through the interaction of nocturnal activity and the latitude of the specific wind farm. Therefore this is a calculation specific to the windfarm in question and hence a re-run of the model is required. However, we acknowledge that the Applicant has not adjusted the collision predictions for other projects within the cumulative/in-combination assessments to account for this, which we welcome.

Consented and 'as built' designs, Cumulative totals and headroom

8. As noted in our Deadline 6 response during the Norfolk Boreas examination[7] and Annex 8 of our response to the additional information provided by Norfolk Vanguard in response to the SoS request[8], Natural England agrees that the standard approach to cumulative and in-combination assessments is to use the consented parameters of each project and to refer to the worst case scenario (WCS) assessed within the relevant Environmental Statement (ES) taking account of any updated assessments provided throughout the examination process.

9. As offshore wind farms are consented based on the Rochdale Envelope approach, the worst case scenarios predicted within the ESs are often different to the predicted impacts from the project 'as built' i.e. once the design is finalised/constructed. Consequently, the use of collision risk estimates calculated based on worst case scenarios may lead to a potential over-estimate of the total cumulative or in-combination assessments in terms of both EIA and HRA. However, it is also possible that the predicted impacts from 'as built' designs are greater than those predicted in the ES e.g. the collision mortalities at Lincs

[7] Natural England (2020) Norfolk Boreas Offshore Wind Farm – Deadline 6: Natural England's comments on Norfolk Boreas approach to as-built vs consented turbine numbers and headroom in cumulative/in-combination collision assessments. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-001760-DL6%20-%20NE%20-%20Comments%20on%20Headroom.pdf

[8] Natural England (2020) Natural England's response to further information submitted by Norfolk Vanguard with regard to the Secretary of State's request for further information. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-004262-Natural%20England%20-%20Comments%20on%20Responses.pdf

OWF increased after application of the correction factor used when calculating the impacts of 'as built' development.

10. Natural England notes that whilst this is recognised as an issue, it is a highly complex one, and **it is important to note that there is not yet an agreed way forward** at present. This approach has also not been subjected to judicial scrutiny. This is why previous Applicants and decision-makers have largely continued to use the standard approach of referring back to the original assessments in the Environmental Statement, in line with Natural England's broad advice on the matter.

11. With regard to collision predictions from non-material change (NMC) Natural England notes that regarding non-material changes (NMC) application being used in cumulative/in-combination collision assessments, as we have noted in Annex 8 of our response to the additional information provided by Norfolk Vanguard in response to the SoS request[8], several unconstructed projects have increased their Rochdale envelopes to include larger turbines rather than reduced it to the new design e.g. the NMC for the Dogger Bank Creyke Beck projects. So whether headroom is potentially available will depend on the specific nature of the NMC in question.

12. As Natural England has stated previously during the Norfolk Vanguard and Norfolk Boreas examinations, we consider that in order for the Examining Authority/Secretary of State (SoS) to be able to factor in retrospective changes to the collision figures for projects in the cumulative and in-combination assessments, an Applicant would need to:

13. Provide documentary proof that the design envelope used to calculate new collision figures is:
    13.1. Secured through a licensing or legally binding mechanism with no further change possible;
    13.2. In addition, for projects that are not built, it should be demonstrated that the design parameters proposed for any updated collision risk modelling (CRM) do not exceed the worst case scenario design envelope for collision mortality of the species of concern e.g. through consideration of other layouts/turbine options and evidence that the total rotor swept area/ CRM for these options are lower than for the design envelope.

14. For projects where revisions to the turbine design parameters can be used to update CRM figures (i.e. where there is a new design envelope which is secured through appropriate

conditions or legally binding commitments), Natural England would need to agree the appropriate model/option and parameters for the updated CRM figures.

15. Our advice is that in these circumstances CRM should be re-run to generate updated collision figures against any agreed changes to turbine design layouts. Where this is not possible for a project because the original bird density data cannot be obtained, we would need to agree whether it is possible for correction ratios to be calculated (for example following an approach such as that presented in Trinder (2017)). Natural England advise that simplistic scaling of collision figures based on reductions in turbine numbers from the consented number should not be used, for example due to variation in flight activity at different heights and differences in turbine parameters such as rotor speeds.

16. Where these requirements cannot be met, cumulative assessments should be based on consented worst case scenarios. It is true that if the CRM is conducted on what will be built rather than the Rochdale envelope worst case scenario that is assessed for each project then the collision predictions would be expected come down However, if the collision model or the density estimates are inaccurate, collision levels could be elevated from those predicted even with the reduction in swept area

17. With regard to the approach to recalculating collision predictions to 'as built' scenarios set out in Trinder (2017), as set out in our Deadline 6 response during the Norfolk Boreas examination[7], Annex 13 of our response to the additional information provided by Norfolk Vanguard in response to the SoS request[8] and in in our response to Examining Authority question 2.2.38 during the Hornsea 3 examination (submitted at Deadline 6 of this examination[9], dated 7th February 2019), Natural England considers it important to make the overarching point that The Crown Estate commissioned the Trinder (2017) report in order to better understand the potential level of 'headroom' for their own purposes (i.e. potentially to inform their decisions on future leasing rounds) and that it was not the intention that the figures from this report, or the methods outlined within it, were used to revise the in-combination assessments of current and future applications.

[9] Natural England (2019) Hornsea Project Three Offshore Wind Farm – Natural England Written Submission for Deadline 6: ISH 5 Annex G: Natural England's Comments on the Applicant's Response to ExA Q2.2.38 [Ornithology, Cumulative and in-combination Assessment]. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-001695-Natural%20England%20-%20ISH5%20Annex%20G-%20Natural%20England%E2%80%99s%20Comments%20on%20the%20Applicant%E2%80%99s%20response%20to%20ExA%20Q2.2.38.pdf

18. Natural England reiterates the comment made during the Hornsea 3 examination (at Deadline 6 of this examination[9], dated 7th February 2019) that Natural England has not checked the details of the calculation for scaling collisions as set out in Trinder (2017), but in principle Natural England is of the view that the calculation method is valid. However, there are a number of issues which mean that the results obtained will not always be accurate. These include the availability of accurate data on the input parameters used in the original modelling and the actual predicted collision figures eventually arrived at in the course of an examination, as these may change several times.

19. Consequently Natural England does not advise that it is used as a method for altering the collision figures of planned and consented projects. We note that during the Hornsea 3 examination, there was an attempt to update the parameters in Trinder (2017) for some offshore wind farms due to this very issue. However, further errors and/or issues were identified with this update (full details are set out in Natural England's Deadline 6 response of the Hornsea 3 examination to ExA question 2.2.38[9], dated 7th February 2019). For these reasons, Natural England does not consider there to be robust evidence available for these corrections. There are also issues regarding the actual turbine specifications for the 'as built' turbines – in the case of the updates undertaken by the Hornsea 3 Applicant, these were done by simply referencing manufacturer information for particular turbine models as evidence of the 'as built' layout for the majority of projects. As noted in our Deadline 6 response to ExA question 2.2.38 at Hornsea 3[9], while these may reflect the actual built turbine parameters for some projects, it is not a sufficiently robust audit trail with respect to an individual project. Therefore consultation with the MMO may be required to obtain the parameters from the construction management plan.

20. Therefore, given these issues, our position remains that CRM should be re-run to generate updated collision figures against any agreed changes to turbine design layouts. Where this is not possible for a project, because original bird density data cannot be obtained, we would need to agree whether correction ratios can be calculated (for example following an approach such as that presented in Trinder (2017)). Natural England would need to see the full calculation details for these correction factors. It is Natural England's advice that simplistic scaling of collision figures based on reductions in turbine numbers from the consented number should not be used, for example due to variation in flight activity at different heights and differences in turbine parameters such as rotor speeds. There are also case-specific issues that need to be addressed: Natural England notes that the Race Bank CRM did not use the Band model, being based instead on the Folkerts model (which was also used for Dudgeon).

21. As noted during the Norfolk Boreas Issue Specific Hearing on 22nd January 2020[10], Natural England has been raising the issue of whether as built or consented projects should be considered for in-combination effects with The Crown Estate, and we note the need for a strategic approach to this issue. If conducted simply on a project-by-project basis this has significant risks of inconsistency of approach across applications. Therefore, we consider that this issue needs to be addressed strategically on behalf of the whole sector, including developing consensus on an approach.

Requirements for discharge of consent

22. It is Natural England's view that for some of the projects included in the cumulative/in-combination collision totals, the marine licence and/or DCO/DMLs do not have a specific requirement to provide information on the as built parameters upon the completion of construction. They also do not have a condition that clearly specifies that the built project becomes fixed for the lifetime of the DCO/DML. In addition phased builds are challenging in this situation as, for many OWF DCOs, there were no limitations for the timings of any subsequent phases. Therefore, we believe that in such circumstances the DCO/DML remains too ambiguous to say it is legally committed to for these projects.

Practicalities

23. Natural England are continuing to review this section and will provide further response in the near future.

Displacement

24. Please see our comments above regarding the Applicant's assertions regarding an over-emphasis on impacts estimated for the upper 95% confidence limits.

25. As noted by the applicant, Natural England advise that displacement effects estimated in different seasons should be summed to provide an annual effect for assessment which should then be assessed in relation to the largest of the component BDMPS populations and the biogeographic population. Whilst we acknowledge that the approach of simply summing the predictions from individual matrices from the different seasons does raise

[10] Natural England (2020) Norfolk Boreas Offshore Wind Farm: Natural England's Written Summary of Oral Representations made at Issue Specific Hearing 4 on offshore effects including the Draft Development Consent Order. Planning Inspectorate Reference: EN010087. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-001630-DL4%20-%20Natural%20England%20-%20Written%20Representation%20of%20Oral%20Case.pdf

the potential issue of double counting, we note that although it can be assumed that the birds within the different seasonal BDMPSs for a given species may have come from the same group of colonies, different birds could be present within the BDMPSs and hence impacted by the OWFs during the different non-breeding seasons identified. For example, during the autumn migration/post-breeding period the birds present could be individuals from the nearest colonies, but by the winter the birds present could be individuals from say Norwegian colonies. In other words, there could be impacts on different sub-sets of the populations. Accordingly we would advise that the approach in the SNCB (2017) displacement advice note is followed: separate matrices should be conducted for multiple non-breeding season BDMPSs where these have been identified and then the predicted impacts from these should be summed, together with those for the breeding season, to give an annual total predicted impact which can then be assessed against the largest BDMPS population. We would also suggest that assessments contextualise the outputs in terms of how precautionary they may be in light of potential for double counting and the other uncertainties around displacement and mortality rates.

Displacement and mortality rate precaution

26. The Applicant states that *'Natural England currently recommend 70% displacement and a maximum 10% mortality in auk displacement assessments'* and that *'for recent windfarm assessments, Natural England have advised that a highly precautionary 10% maximum mortality rate should be used for birds (RTDs) displaced by cable laying vessels.'* This is not an accurate reflection of our advice. Where a given dataset or parameter has a significant degree of uncertainty, Natural England takes a range-based approach when considering impacts, evaluating outputs across that range (e.g. 30-70% displacement for auks and 1-10% mortality for auks and for red-throated diver displacement from cable laying vessels).

27. In addition the Applicant notes that the review of studies conducted at operational wind farms during the Vanguard Examination (MacArthur Green 2019) concluded that an evidence-based, but still precautionary, assessment of displacement of auks by offshore wind farms might assume that their densities would be reduced inside offshore wind farms by 50% relative to densities in the surrounding area, and by 30%, on average, across a 1 km buffer zone surrounding the wind farm. As was noted in our Deadline 3[11] response

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

during the Vanguard examination, Natural England considers that the evidence for auk displacement is variable, with some studies finding a strong displacement effect of guillemots and razorbills from offshore wind farms, whereas other studies have found none. For example displacement of guillemots and razorbills have been reported in the non-breeding season in the southern North Sea of distances from 2 to 4km (Petersen et al. 2004) and Petersen & Fox (2007) demonstrated the exclusion of guillemots out to at least 2km at Horns Rev development site. Mendel et al. (2014), studying the Alpha Ventus windfarm in Germany found that guillemot were in significantly lower numbers in all distance bands from the windfarm (out to 6-10km), with the highest displacement within 2km of the windfarm (razorbill were not in sufficient numbers to assess). Welcker & Nehls (2016), also studying Alpha Ventus, found that auks (predominantly guillemot) were 75% lower inside compared to outside the windfarm and that the lower numbers were evident out to 2.5km of the windfarm. Welcker & Nehls (2016) also conducted a literature review of studies looking at displacement and concluded that there was strong evidence across studies that auks are displaced by offshore windfarms.

28. However, this has not been the case for other studies, e.g. guillemots at Robin Rigg wind farm in Scotland (Vallejo et al. 2017) and a study by Webb et al. (2017) found no displacement or attraction occurred at the Lincs and LID wind farms for all auks. Dierschke et al. (2016) conducted a review (for full details see table 3 in the paper) and they concluded that common guillemot and razorbill 'weakly avoided' windfarms. We note that displacement of auks may be state-specific (breeding or non-breeding) or it may be due to habitat quality and/or availability (e.g. birds will be more easily displaced from poorer quality habitat or where habitat is not limiting). Hence we conclude that consideration of a range of displacement rates from 30%-70% across a 2km buffer remains robust and evidence-based advice.

29. As noted in our Deadline 9 response at Norfolk Vanguard[1] and our Deadline 4 response at Norfolk Boreas[2], it is not the case that Natural England focusses its assessments on a 10% mortality rate alone – we consider a range of potential rates. Critically though, empirical evidence regarding the energetic consequences of displacement for seabirds and wintering waterbirds using the marine environment are very limited, and the role of overwinter survival on seabird population dynamics is poorly understood. Therefore as there is very little information available about the consequences of displacement for individuals, there is actually no evidence to suggest that 10% is precautionary. Furthermore, we again note that the mortality rates are a crude method of capturing a range of potentially deleterious effects that could arise from displacement, including

reduced fitness for migration and reduced productivity during the breeding season. These are particularly relevant when considering displacement effects within sites designated for the species affected.

Seasonal considerations and assignment to breeding colonies

30. As noted in our Deadline 9 response during the Norfolk Vanguard examination[1], we are not aware of any particular evidence that could provide any means of quantifying the Applicant's assertion that *'If birds made multiple long trips, they would simply run out of time to provide their chicks with the daily sustenance they require to survive and grow.*'

31. With regard to seasonal definitions and foraging ranges, limited empirical data are available regarding the behaviour of seabirds in the offshore environment, including between different seasons. For example, whilst tracking data has significantly improved our understanding of seabird foraging behaviour in the breeding season, data collected is confined to certain colonies/species and in any given tracking season only a very small proportion of the birds present at the colony are tracked. The detailed nature of behaviour of seabirds from any given colony in the early and latter stages of the breeding season are poorly understood, but it is clear from data collected at the Alde-Ore and other colonies that birds can be present at the colonies in meaningful numbers at these times, and interacting with the offshore environment when not present at the colony. Natural England notes that the East Anglia One North and East Anglia Two sites are located within the foraging range of LBBG from the Alde-Ore Estuary SPA. Therefore, we consider that the full breeding season in Furness (2015) is the most appropriate for assigning monthly impacts to the breeding season. Excluding these months from an assessment of impacts is likely to result in birds with connectivity to the SPA being excluded, which is why Natural England advises they are included.

Summary

32. The Applicant considers that the end result of the various aspects of precaution in assessments is that the final impact conclusion is based on considerable over-estimation and that this is then further compounded when individual project level impacts and their inherent precaution are added together in cumulative and in-combination assessments. With regard to the combined impact of over precaution in assessments, as we have noted in our Deadline 4 responses[2, 12] at Norfolk Boreas and in our response to ExA question

[12] Natural England (2020) Norfolk Boreas Offshore Wind Farm – Natural England's Written Summary of Oral Representations made at Issue Specific Hearing 4 on offshore effects including the Draft Development Consent Order. Available from: https://infrastructure.planninginspectorate.gov.uk/wp-

2.8.4.4 at Norfolk Boreas[13], whilst each uncertainty has the potential to compound the overall uncertainty, our understanding is that in the collision assessments the central predicted value (i.e. those for the mean bird density, mean/central avoidance rate, mean/central flight height) from each individual project assessment is carried forward into cumulative and in-combination assessments, rather than the upper figures from any predicted range based on uncertainties in the input data. In any event, for all Round 1 and Round 2 projects the use of a range of figures is simply not possible, because earlier windfarm Environmental Statements did present information to generate ranges of predicted impacts.

33. We note that there is also a broader tendency in impact assessments to straightforwardly adopt findings from the latest research rather than also consider previous research findings using a 'weight of evidence' approach. In this context Natural England considers that a range-based approach to key parameters such as apportioning rates, nocturnal activity, avoidance rates, displacement and mortality rates etc. is advisable. To do otherwise and rest assessments on single values, sometimes based on a limited number of studies or even a single study, risks incorporating a misleading level of precision into impact assessments.

34. There are elements where the assessment may not be precautionary (e.g. the potential limitations in recording of site-specific data on seabird flight heights may have the potential to lead to underestimates of potential collisions and hence assessments may be lacking in precaution in this aspect). Further, the level of uncertainty in the assessments is high and therefore there is a requirement to be precautionary in our assessment of impacts.

35. Another element where assessment is not precautionary enough is the significant underestimate of red throated diver displacement. The Applicant assumes displacement out to 4km, whereas recent evidence is that red throated divers are displaced by the presence of windfarms to distances in excess of 10km. See Natural England's main response to the Relevant Representations response document.

Impact Consequences

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[13] Natural England (2020) Norfolk Boreas Offshore Wind Farm – Natural England's responses to Examining Authority's Further Written Questions and Requests for Information (ExQ2). Available from: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-001742-DL5%20-%20Natural%20England%20-%20Resposnes%20to%20ExA's%20FWQ%20(ExQ2).pdf

36. With regard to the use of density dependent versus density independent PVA models, as noted in our response to ExA question 2.8.4.4 during the Norfolk Boreas examination[13], we agree that density dependence is likely to be operating at seabird colonies. Our position regarding density dependent versus density independent PVA outputs is that if there is clear evidence of the form and strength of density dependence operating on the focal population (colony), then we would (depending on the evidence provided) consider the outputs from density dependent models. Accordingly it is important to consider whether there is any actual evidence that density dependence is acting on the focal population at the present time. We recommend using a density independent model where there is no information on population regulation for the focal population. In the case of the colonies relevant for East Anglia One North and East Anglia Two (e.g. kittiwake at FFC SPA and LBBG at Alde-Ore Estuary SPA), we have considered the density independent model outputs to be the most appropriate in previous offshore wind farm assessments as there is no clear evidence to support the application of any particular form or magnitude of density dependence operating.

37. Without having good evidence to support what form and strength of density dependence to add to a model we have no way of knowing whether the predictions from a density dependent model are robust or accurate, which is why we advise use of the density independent models in such circumstances. If an Applicant has acceptable evidence to support the use of density dependence in the models then Natural England would of course consider these outputs, but there should be a justification of the density dependent terms used and presentation of a range of outputs, which hasn't tended to be the case with previous submissions.

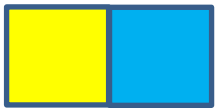
38. In any event, the use of the counterfactual metrics recommended by Natural England (counterfactual of growth rate and counterfactual of population size) does make the metrics less sensitive to mis-specifying density dependence or density independence.

SYNTHESIS

39. Please see our responses above regarding the Applicant's comments regarding precaution in advice on avoidance rates and nocturnal activity used in CRM.

CONCLUSION

40. Natural England disagrees with the Applicant that estimates of impact magnitude are inflated for individual projects and this is compounded when applied to the cumulative assessment. Whilst we accept that there is a great deal of uncertainty around the



predictions of mortality, we do not accept that assessments are too precautionary, and advise that decision-makers take a range-based approach to considering impacts.