

Date: 04 July 2022
Our ref: Case: 13622
Your ref: EN010098



National Infrastructure Planning
The Planning Inspectorate
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BY EMAIL ONLY

Dear Sir/Madam,

Hornsea Four Offshore Wind Farm

The following constitutes Natural England's formal statutory response for Examination Deadline 5a.

1. Natural England Deadline 5a Submissions

Owing to the short time period between Deadlines 5 and 5a, Natural England have been unable to review all of the documents submitted at Deadline 5. To ensure some progress can be made at this Deadline, we have prioritised review of documents we consider to be of highest importance, as well as submissions we were unable to review for Deadline 5. As such, the documents submitted by Natural England at Deadline 5a are as follows:

- EN010098 H4 Appendix B5a - NE advice on the ornithology baseline
- EN010098 H4 Appendix I5a - Natural England comments on the draft DCO

The documents reviewed by Natural England to inform these submissions are as follows:

- REP5-087 G5.9 Revised Ornithology Baseline - Revision: 01
- REP4-049 An updated version of the draft Development Consent Order (DCO) (Tracked)
- REP4-014 C1.1.1 Schedule of Change to the draft Development Consent Order (DCO) and Deemed Marine Licences (DML) (Tracked)

Of the remaining documents submitted at Deadline 5, Natural England will review and/or provide comment on the following documents at Deadline 6 where possible:

- REP5-003 Deadline 5 Submission - A1.4 Volume A1, Chapter 4 - Project Description (Tracked) Revision: 5
- REP5-013 B2.2 Report to Inform Appropriate Assessment Part 1 (Tracked) Revision: 03
- REP5-015 B2.2.2 Habitats Regulations Assessment Compensation Measures Part 1 (Tracked) - Revision: 02
- REP5-017 B2.7 Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Kittiwake Compensation Plan (Tracked) - Revision: 02
- REP5-019 B2.7.2 Volume B2, Annex 7.2: Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Kittiwake Offshore Artificial Nesting Roadmap (Tracked) - Revision 04
- REP5-023 B2.7.6 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Overview (Tracked) - Revision 02
- REP5-025 B2.7.6 Outline Kittiwake Compensation Implementation and Monitoring Plan (Tracked) - Revision 02
- REP5-027 B2.8 Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Guillemot and Razorbill Compensation Plan (Tracked) - Revision: 02
- REP5-029 B2.8.2 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Guillemot and Razorbill Bycatch Reduction: Roadmap (Tracked) - Revision: 04
- REP5-031 B2.8.4 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Predator Eradication: Roadmap (Tracked) Revision: 04
- REP5-035 B2.8.7 Outline Gannet, Guillemot and Razorbill Compensation Implementation and Monitoring Plan (Tracked) - Revision 02
- REP5-036 C1.1.1 Schedule of Changes to the draft Development Consent Order (DCO) and Deemed Marine Licences (DML)
- REP5-049 G1.10 Hornsea Four Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (Tracked) Revision: 03
- REP5-058 G1.33 Predator Eradication Island Suitability Assessment: Bailiwick of Guernsey (Tracked) Revision: 02
- REP5-065 G4.7 Ornithological Assessment Sensitivity Report - Revision: 2
- REP5-066 G5.10 Professor Mike Elliot's Marine Processes Report Review - Revision: 01
- REP5-068 G5.13 Bycatch Reduction Technology Selection Phase Summary - Revision: 01
- REP5-074 G5.2 Applicant's Responses to the Examining Authority's Second Written Questions (ExQ2)
- REP5-078 G5.25 Ornithology Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) Annex
- REP5-081 G5.3 Applicant's comments on other submissions received at Deadline 4
- REP5-082 G5.4 Predator Eradication Implementation Study Update - Revision: 01
- REP5-083 G5.5 Clarification Note on Drill Arisings and Deposited Sediments - Revision: 01
- REP5-085 G5.7 Indirect Effects of Forage Fish and Ornithology - Revision: 01

- REP5-086 G5.8 Orsted's approach to strategic ecological compensation - Revision: 01
- REP5-087 G5.9 Revised Ornithology Baseline - Revision: 01
- REP5-089 Updated draft Development Consent Order (dDCO) (Tracked)

Natural England will not review and/or provide comment on the following documents at future deadlines:

- REP5-021 B2.7.4 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Kittiwake Onshore Artificial Nesting Roadmap (Tracked) - Revision: 04
 - Natural England's position on the provision of further onshore artificial nesting as a compensatory measure remains unchanged. We have no further comment to make.
- REP5-033 B2.8.6 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Fish Habitat Enhancement: Roadmap (Tracked) Revision: 04
 - Natural England reiterates our support of the Applicant pursuing an ecosystem enhancement resilience measure. However, as the provision of resilience measures has no legal basis under the Habitats Regulations (2017), we consider there is more value to be gained from focussing our efforts on reviewing the main compensation measures.
- REP5-069 G5.15 Outline Gannet Compensation Implementation and Monitoring Plan Bycatch Reduction Revision: 01
- REP5-070 G5.16 Outline Gannet Compensation Implementation and Monitoring Plan: Artificial Nesting Structures - Revision: 01
- REP5-071 G5.17 Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Gannet Compensation Plan - Revision: 1
- REP5-072 G5.18 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Gannet Bycatch Reduction: Roadmap - Revision: 01
- REP5-073 G5.19 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Gannet Bycatch Reduction: Roadmap: Gannet Artificial Nesting: Roadmap - Revision: 01
 - It is our understanding that information is due to be submitted by the Applicant at Deadline 5a which should allow gannet to be removed from consideration for compensation measures.

2. Notification of Population Viability Analysis model issue

Between Deadlines 5 and 5a, Natural England have been notified by the developers (BioSS/CEH) of an issue with the NE/JNCC Population Viability Analysis (PVA) tool. This tool is used by the Applicant under Natural England's advice, to investigate population level responses to changes in survival rates resulting from the estimated impacts from the project alone, cumulatively or in-combination with other projects. PVA allows a comparison to be drawn between predicted population metrics (growth rate and population size) under impacted and un-impacted scenarios.

Whilst we intend to comment fully on G4.7 Ornithological Assessment Sensitivity Report [REP5-065] at Deadline 6, we have examined the PVA logs provided within it to identify any analyses that may

be affected. We have provided advice to the Applicant with this information alongside recommendations for how this can be addressed. For transparency, we have included this advice as an Appendix to this letter.

Please note, this issue does not affect agreement of the baseline data or the PVA undertaken for species other than kittiwake. It will therefore not influence conclusions in relation to HRA/EIA (noting Natural England's existing position on kittiwake in-combination). However, it may influence interpretation of the PVA results for kittiwake with implications for determining final impact levels to inform compensation provision. We have therefore requested that the Applicant submit reruns into Examination at the earliest opportunity.

Natural England have also provided advice to the Applicant in relation to an outstanding action from the Ornithology MRSea Technical Panel meeting held on 25th May 2022, detailed in the minutes submitted at Deadline 5 [REP5-080]. This advice is also included in Appendix 1.

For any queries relating to the content of this letter please contact me using the details provided below.

Yours faithfully,

Emma John
Yorkshire and North Lincolnshire Area Team

[REDACTED]
[REDACTED]

Appendix 1: Advice provided to the Applicant regarding PVA modelling

Date: 04 July 2022
Our ref: NA
Your ref: NA



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BY EMAIL ONLY

Dear Julian,

Development proposal and location: Hornsea Project Four Offshore Wind Farm

Notification of NE/JNCC PVA model issue

Between Deadlines 5 and 5a, Natural England have been notified by the developers (BioSS/CEH) of an issue (coding bug) with the NE/JNCC Population Viability Analysis (PVA) tool. The identified issue causes the tool to produce incorrect results in situations where environmental stochasticity is included and a standard deviation (SD) of *exactly* zero is used for at least one of the baseline demographic rates. There appears to be no problem when using any other values, including very small but non-zero values, for the SD.

The developers are currently trying to fix this issue as soon as practicable with support from Natural England.

We have examined the PVA logs provided by Hornsea 4 in G4.7 Ornithological Assessment Sensitivity Report at Deadline 5 [REP5-065] to identify any analyses that this issue may affect. We have identified the following PVA model runs as being susceptible to the identified issues:

- FFC SPA kittiwake PVA validation test (**Survival rate age class 0-1, sd: 0**)
- FFC SPA kittiwake PVA validation test: variation in productivity rate to 0.8 (**Productivity rate, sd: 0 & Survival rate age class 0-1, sd: 0**)
- Kittiwake UK North Sea BDMPS PVA (**Survival rate age class 0-1, sd: 0**)
- Kittiwake UK Biogeographic PVA (**Survival rate age class 0-1, sd: 0**)
- FFC SPA kittiwake PVA (**Survival rate age class 0-1, sd: 0**)
- FFC SPA kittiwake PVA: variation in productivity rate to 0.8 (**Productivity rate, sd: 0 & Survival rate age class 0-1, sd: 0**)

Recommendations

Natural England advise that these models are rerun using the following approach:

- Where the SD for the survival rate of the age class 0-1 has been specified as zero, Natural England recommend using the same value (0.077) as applied in recent PVAs for the Norfolk

Boreas ([EN010087-002896-SoS Deadline - Applicant - Updated Population Viability Analysis Flamborough and Filey Coast SPA - Updated at the request of Natural England.pdf \(planninginspectorate.gov.uk\)](#)) and Vanguard ([EN010079-004399-Updated Population Viability Analysis Flamborough and Filey Coast SPA.pdf \(planninginspectorate.gov.uk\)](#)) Examinations. This value is equivalent to the SDs populated for the survival rates of the other age-classes.

- Where productivity has been specified as 0.8 we advise that, in the absence of an empirically derived SD, Ørsted simply specify this as a small number that is greater than zero (e.g. 0.0000001).

We apologise for the inconvenience this may cause but want to make clear that this issue will not affect agreement of the baseline ornithology data for Hornsea Four, or the PVAs undertaken for species other than kittiwake. It will therefore not influence conclusions in relation to HRA/EIA (noting Natural England's existing position on kittiwake in-combination). However, it may influence interpretation of the PVA results for kittiwake with implications for determining final impact levels to inform compensation provision. We therefore recommend that Hornsea Four submit the reruns into Examination at the earliest opportunity.

Natural England also recommend that Hornsea Four consider the advice provided in Annex 1 below in relation to the reference populations used in PVAs for EIA. This advice is provided in response to an outstanding action from the Ornithology Technical Panel meeting held on 25th May 2022.

For clarification of any points in this letter, please contact me using the details provided below.

The advice provided in this letter has been through Natural England's Quality Assurance process

Yours sincerely,

Emma John
Yorkshire and North Lincolnshire

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Annex 1: Additional comments on the estimation of the maximum BDMPS reference population for EIA

During the Offshore Ornithology MRSea Technical Panel meeting held on 25th May 2022, Hornsea Four asked whether Natural England could comment on their approach to recalculating the annual BDMPS values in relation to overseas birds (as set out in the baseline sensitivity report - REP3-029). We provide the following response and note that it has implications for the EIA scale reference populations used in G4.7 Ornithological Assessment Sensitivity Report [REP4-041/REP5-065].

Natural England provided Hornsea Four with clarification on the calculation of breeding season reference population estimates at the BDMPS scale for use in EIA at Deadline 1 within our Risk and Issues Log (Line 60). We welcome that Hornsea Four have taken this into consideration within G4.7 Ornithological Assessment Sensitivity Report. However, Hornsea Four have noted that when considering annual impacts, birds from both the UK and overseas should be accounted for. Natural England note that this is currently the case within the BDMPS reference populations outside the breeding season, but that our current advice for defining the breeding season BDMPS population only includes UK populations within the relevant BDMPS area.

Hornsea Four have provided revised breeding BDMPS population estimates (Table 1) which include a BDMPS overseas population apportioned to the relevant BDMPS area outside of the breeding season. For puffin, guillemot and great black-backed gull, Hornsea Four have added the total overseas population during the non-breeding season in the relevant UK North Sea and Channel, or UK North Sea waters BDMPS areas. In the case of kittiwake, Hornsea Four has added the total overseas population for the autumn migration in the North Sea. For gannet, the total overseas population in the autumn has been used for the North Sea and Channel area. We question why, for razorbill, Hornsea Four appears to have added the total overseas population during the migration season from the Wester Waters BDMPS area rather than the relevant North Sea and Channel area. We also note that the breeding season total presented in Table 1 for great black-backed gull (25,826) does not align with our calculation of 25,917. This difference would result in a revised estimate of 88,653 birds compared to Hornsea Four's 88,562.

Natural England consider that during the breeding season, it is more likely that both adults and immatures are more likely to be associated with breeding colonies in overseas waters and connectivity to the relevant BDMPS areas is likely to be much more limited than in the non-breeding season. Connectivity to the different BDMPS areas for adult birds will be dependent on species-specific foraging ranges in combination with the proximity of the colony to the relevant BDMPS area. Whilst immatures may be wider ranging, a large proportion may be expected to remain close to breeding colonies. Thus, we consider using estimates of the numbers of birds that could be present in the relevant BDMPS area outside the breeding season is likely to overestimate the size of the population, particularly where there are large overseas populations (e.g. razorbill). Whilst we acknowledge the breeding BDMPS populations advised by Natural England do not include any birds from overseas areas, there is currently no way of estimating the proportions of birds from overseas colonies that may spend time in respective UK BDMPS areas during the breeding season with confidence. We therefore consider that during the breeding season, it is precautionary to only include birds from relevant UK colonies within respective BDMPS areas in the estimation of the breeding season BDMPS populations.

To summarise, Natural England maintain their advice that the largest unrevised Natural England breeding or non-breeding BDMPS reference populations should be used in the annual assessments for EIA. Based on this conclusion, we do not agree with the BDMPS populations used in the assessments (including PVA) of kittiwake, guillemot and puffin provided in the G4.7 Ornithological Assessment Sensitivity report submitted at Deadline 5. We suggest the relevant analyses are revisited and our original advice on the BDMPS populations to be used in the assessment is followed.

