Hornsea Project Four

Clarification Note Revised Ornithology Baseline

Deadline: 5a, Date: 04 July 2022
Document Reference: G5.40
Revision: 01

Prepared	APEM ltd, June 2022
Checked	APEM ltd, June 2022
Accepted	Hannah Towner-Roethe, July 2022
Approved	Julian Carolan, July 2022

G5.40
Ver. A

Revision Summary

Rev	*Date*	*Prepared by*	*Checked by*	*Approved by*
01	04/07/2022	APEM Ltd, July 2022	Hannah Towner-Roethe, Orsted, July2022	Julian Carolan, Orsted, July2022

Revision Change Log

Rev	*Page*	*Section*	*Description*
01	NA	NA	Submitted into Examination at Deadline 5A

Table of Contents

1 Natural England Ornithology Baseline Clarifications

1.1.1.1 On receipt of **G5.9 Revised Ornithology Baseline (REP5-087)**, Natural England provided the Applicant with a number of clarification questions via an email (see **Appendix A**) entitled "Hornsea 4 baseline clarifications" sent on the 24th June 2022. The e-mail contained several clarification questions in relation to the information pertained within the report. This document provides the Applicant's responses to the clarification questions raised by Natural England and any additional information required.

1.2 1. Table 1 (Gannet MRSea_V2 estimates) appears to have been populated incorrectly with the values for flying and sitting birds not summing to the total estimates. Could this be checked and a revised table provided if needed?

1.2.1.1 The Applicant has reviewed Table 1 in **G5.9 Revised Ornithology Baseline (REP5-087)** and noted that the pre-apportioned flying and sitting values (central, Lower CI and Upper CI) had been incorrectly presented. A correct version is provided in an update to the **G5.9 Revised Ornithology Baseline**, which will be submitted at Deadline 5a. To clarify the final central abundance estimates for all behaviours, flying and sitting were correct in the original table, the minor differences between the summed flying and sitting totals versus the final all behaviour abundance estimate is due to minor rounding differences.

1.3 2. Could clarification be provided on how the model outputs are ordered for guillemot in Figures 23-25 of the revised baseline document? It looks like there might be a month/year labelling system but it isn't clear.

1.3.1.1 The naming convention of the model outputs for figures 23-25 in **G5.9 Revised Ornithology Baseline (REP5-087)** is based on the monthly survey IDs provided by the aerial survey provider for Hornsea Four. The naming convention is detailed below for an example survey:

M01_S01_D01_17 = January 2017 survey

- M01: This denotes the survey month, in this instance M01 equates to January
- S01: This denotes the survey number for the month, an example where this might deviate from being S01 is where two surveys in a single month are required due to a survey being missed in a previous month (e.g May 2016 survey was completed in June 2016).
- D01: This denotes the day of the survey if conducted over multiple days. For Hornsea Four all surveys were completed in a single day.
- 17: This denotes the year of the survey, in this instance 17 equates to the year 2017.

1.4 3. There is one survey in Figures 23-25 where there appears to be no guillemot on several transects at all (M10_S01_D01_17). Could it be confirmed if this is correct, a plotting error or some other data treatment error?

1.4.1.1 As detailed **in A5.5.1 Environmental Statement Volume A5 Annex 5.1 Offshore and Intertidal Ornithology Baseline Characterisation Report (APP-074)**, four transect lines were not completed during the October 2017 (M10_S01_D01_17) due to poor weather conditions, hence why there is an area where no guillemots were recorded.

1.5 4. We note that LCL and UCL values have not been provided alongside the final abundance and density estimates and consider them necessary to understand the central estimates. As the central estimates are corrected by adding additional apportioned birds/birds beneath the water numbers for each survey for certain species, we suggest that the UCL and LCL should be adjusted according to the proportional increase in the central estimate. This would provide indicative confidence limits for the final estimate that can be used in the assessment. For example, if the central abundance estimate was increased from 1453 to 2066 (addition of 613 birds and percentage increase of 42.19%) the UCL and LCL values would be multiplied by 1.4219 (e.g. for a LCL of 714, this would increase to 1015.5). Could Ørsted please confirm whether they agree with this approach to deriving the UCLs and LCLs for the final estimates and if they are happy to submit these into examination.

1.5.1.1 The suggested approach of adjusting the confidence intervals according to the proportional increase in the abundance estimate would not represent a defined confidence level. It would simply represent a proportional shift of the intervals based on the previous output from the bootstrapping at an unknown confidence level as it would not account for any changes in the resampling that would occur when the additional birds are included. This is an important consideration as the upper and lower confidence intervals (Cis) are derived from boostrapping with replacement using the counts from individual transects and the 97.5th and 2.5th percentiles from the output. Therefore, depending in which transects these additional birds are from and how that affects the count range between transects will influence the upper and lower Cis around the abundance estimate. The upper and lower intervals are likely to also be different in size and therefore may change disproportionately when the abundance estimate changes, unlike CIs derived from a mean and standard deviation, which are equal. Hence, an accurate upper and lower CI representing a 95% confidence level cannot be achieved by simply adjusting the current intervals using a factor based on percentage increase in the abundance estimate. The Applicant therefore advocates that the unapportioned upper and lower CI should be used for interpreting confidence levels around the abundance estimate.

1.6 5. Could it be confirmed that the 'final density' estimates are simply the final abundance estimates divided by the relevant area (e.g. the array = 468 km2) and that the same method detailed in point 2 could be used to derive associated final UCL and LCL values?

1.6.1.1 For clarity when modelling both the MRSea and design-based abundance estimates, the models produce both a density and abundance estimate value. Unidentified abundances are then applied to the pre-apportionment abundance and a correction factor for availability bias also (for auk species) applied to calculate a final abundance estimate value. The final density estimate is then calculated by dividing the final abundance estimate value by the DCO Application array area, which equates to 468 km^2 (or applicable array area plus buffer area).

2 Gannet Additional Requests

2.1 Additional CRM modelling Request

2.1.1.1 In addition to the clarification questions raised above Natural England requested further modelling of gannet impacts associated with collision risk apportioned to the FFC SPA. This is to consider reductions of 80%, 75%, 70%, 65% and 60% to the monthly seabird density estimates for gannet to account for macro avoidance within collision risk modelling. In order to account for this significant additional effort for providing collision risk impact values the Applicant intends to provide the additional CRM assessments within an updated version of the **G5.25 Ornithology Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA)** Annex to be submitted at Deadline 5a.

2.2 Applicant's Gannet AEoI Position

2.2.1.1 Natural England also recommended that the Applicant identifies the "tipping point" at which point the Applicant's predicted impacts wouldn't result in an AEoI. In response to this recommendation, the Applicant remains of the position that even when considering no reduction in the monthly seabird density estimates to account for macro avoidance an AEoI can be ruled out for gannet for Hornsea Four alone and in-combination with other projects for impacts apportioned to the FFC SPA.

2.2.1.2 As presented within **G5.25 Ornithology Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) Annex (REP5-078)**, the Applicant calculated the in-combination predicted mortality due to displacement as equating to between 39.2 to 72.5 when considering consented only projects or between 41.0 and 76.1 for all projects and in-combination collision risk predicted mortality as 300.8 for consented projects only and 330.6 for all projects. When considering the revised PVA analysis presented in **G4.7 Ornithological Assessment Sensitivity Report (REP5-065)**, the closest predicted impacts modelled is an increase of 325 breeding adult mortalities per annum to 425 breeding adult mortalities per annum which equated to a reduction in growth rate of 1.43% to 1.88% per annum.

2.2.1.3 In relation to gannet feature of the FFC SPA Natural England provided Norfolk Boreas (Natural England, 2020) with the following advice in relation to plausible future growth rates:

2.2.1.4 *"If the colony were to experience an annual growth rate of 2% or more per annum over the next 30 or so years, then the integrity of the site for this feature is high, with high rates for self-repair, and self-renewal under dynamic conditions with minimal external management. Therefore, the FFC gannet population is believed to be robust enough to allow the conservation objective to maintain the population at (or above) designation levels and sustain additional alone and in-combination mortalities from the offshore wind farms. Our justification for this position is we consider it to be highly unlikely that the FFC annual growth rate would be as low as 1%, and from the analysis of gannet colony growth rates we have conducted the current annual growth rate of c 11% appears to be relatively high for a colony of this age and so the colony is likely to do better than a 1.3 % annual growth rate in the foreseeable future."*

2.2.1.5 The FFC SPA gannet colony over the last 50 years has grown at an average rate of 14.40% per annum and an average growth rate over the last 10 years of over 8% per annum,

suggesting that a colony growth rate of 2% (average gannetry growth rate for the first 80 years or so of existence) or more is highly likely when considering the colonies current trajectory. When considering a maximum reduction of 1.88%, which can be considered highly precautionary based on the latest evidence as detailed in **G4.7 Ornithological Assessment Sensitivity Report (REP5-065)**, the colony would still continue to grow, and therefore the potential for an AEoI on the relevant conservation objective of the FFC SPA in relation to combined gannet in-combination displacement and collision effects can be ruled out and, subject to natural change, gannet will be maintained as a feature in the long term.

3 References

Natural England (2020). Natural England's comments in relation to the Norfolk Boreas updated ornithological assessment, submitted at Deadline 2 [REP2-035]. PINS Ref REP4-040.

APPENDIX A

Good afternoon Julian,

Thank you for providing the updated baseline documents. Andrew has had a look through G5.9 Revised Ornithology Baseline and has provided some initial feedback. Given that agreement of the baseline is fundamental to progressing ornithology, we'd like to try and resolve the points listed below and reach agreement ahead of Deadline 5a if at all possible so that we can close out the baseline. I don't think any of us want to see this included on the agenda for the hearings! If you are able to provide these clarifications we could issue a joint statement for submission at Deadline 5a confirming our agreement based on this updated information.

1. Table 1 (Gannet MRSea_V2 estimates) appears to have been populated incorrectly with the values for flying and sitting birds not summing to the total estimates. Could this be checked and a revised table provided if needed?
2. Could clarification be provided on how the model outputs are ordered for guillemot in Figures 23-25 of the revised baseline document? It looks like there might be a month/year labelling system but it isn't clear.
3. There is one survey in Figures 23-25 where there appears to be no guillemot on several transects at all (M10_S01_D01_17). Could it be confirmed if this is correct, a plotting error or some other data treatment error?
4. We note that LCL and UCL values have not been provided alongside the final abundance and density estimates and consider them necessary to understand the central estimates. As the central estimates are corrected by adding additional apportioned birds/birds beneath the water numbers for each survey for certain species, we suggest that the UCL and LCL should be adjusted according to the proportional increase in the central estimate. This would provide indicative confidence limits for the final estimate that can be used in the assessment. For example, if the central abundance estimate was increased from 1453 to 2066 (addition of 613 birds and percentage increase of 42.19%) the UCL and LCL values would be multiplied by 1.4219 (e.g. for a LCL of 714, this would increase to 1015.5). Could Ørsted please confirm whether they agree with this approach to deriving the UCLs and LCLs for the final estimates and if they are happy to submit these into examination.
5. Could it be confirmed that the 'final density' estimates are simply the final abundance estimates divided by the relevant area (e.g. the array = 468 km2) and that the same method detailed in point 2 could be used to derive associated final UCL and LCL values?

In addition to this, we have had an update on the 'Consideration of avoidance behaviour of Northern gannet *Morus bassanus* in collision risk modelling for offshore wind farm impact assessments' paper, and unfortunately Hi Def have had to delay submission due to staff illness. We've had a quick discussion with the ornithologists about a way forward on this as whilst we don't want to publish the paper/ or confirm values within it until all the SNCBs are in agreement, we'd also like to be in a position to progress this issue on Hornsea 4.

We thought a good option could be for you to present a range of scenarios - i.e. 80% reduction, 75% reduction, 70% reduction, 65%, 60% (I'm told this should be relatively easy to calculate) we'd expect that each of these values would take you out of the realms of AEoI and we would be able to agree that the % reduction should lie within the realms of these scenarios.

It may be also be helpful to the ExA/SoS if you could identify the "tipping point" at which your numbers wouldn't result in AEoI. So for example you could say that we would only need to reduce our numbers by X% to rule out AEoI, however, it is anticipated that the reduction will be upwards of 60%.

Hopefully this would allow you to drop gannet compensation and if the paper can be published/shared before the end of the examination there would be scope to include more definitive figures.

Kind regards,
Emma

Dr Emma John
Marine Lead Advisor
Yorkshire and North Lincolnshire
Natural England