From:	Brown, Emma
To:	Hornsea Project Three
Subject:	Hornsea Project Three - Deadline 9 Response from Natural England
Date:	26 March 2019 19:14:13
Attachments:	SouthernNorthSeaDRAFTConservationObjectivesAndAdviceOnActivities.pdf EN010080 Hornsea Project Three Deadline 9 Natural England Comments on ExA Q F3.1.pdf EN010080 Hornsea Project Three Deadline 9 Natural England Correction to REP7-078.pdf EN010080 Hornsea Project Three Deadline 9 Natural England Response to ExA Q F4.1, F4.2 and F4.3.pdf EN010080 Hornsea Project Three Deadline 9 Natural England's Response to ExAQ F6.1.pdf EN010080 Hornsea Project Three Deadline 9 Natural England"s comments on the Applicant"s D7 Submissions.pdf OffshoreRegisterEntry_SouthernNorthSea (Citation).pdf

Good Evening,

Please find attached Natural England's Deadline 9 Response.

This includes:

- Natural England's Comments on the Applicants D7 submissions
- Natural England's Comments on ExA Q F3.1
- Natural England's Response to ExA Qs F4.1, F4.2 and F4.3
- Natural England's Response to ExA Q F6.1
- Offshore Register Entry for the SNS SAC (Citation)
- SNS SAC Draft Conservation Objectives and Advice on Activities

Kind regards,

Emma

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Please note I currently work Monday - Thursday

http://www.gov.uk/naturalengland

We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010

HORNSEA PROJECT THREE OFFSHORE WIND FARM

Planning Inspectorate Reference: EN010080

NATURAL ENGLAND

Written Submission for Deadline 9

Natural England's comment on the ExA's Rule 17 letter to the Applicant dated 19th March 2019

[ExA Q F3.1]

26 March 2019

ExA Question F3.1	Natural England Comments
There are differing views before the Examination on the appropriate parameters to use in collision risk modelling (CRM). The Examining Authority (ExA) has not concluded on these matters and will continue to consider all points of view. The request to re-run the CRM set out below may assist the ExA. The ExA will take any results into account together with all other evidence on this topic. Please run the CRM using the digital aerial survey data with the following species-specific parameters: **Bird Length (m)** Gannet 0.94 (Robinson 2017) Kittiwake 0.39 (Robinson 2017) Lesser black-backed gull 0.58 (Robinson 2017) Great black-backed gull 0.71 (Robinson 2017) Herring gull 0.60 (Robinson 2017) **Wing Span (m)** Gannet 1.72 (Robinson 2017) Kittiwake 1.08 (Robinson 2017) Lesser black-backed gull 1.42 (Robinson 2017) Great black-backed gull 1.58 (Robinson 2017) Herring gull 1.44 (Robinson 2017) **Flight Type** Gannet Flapping Kittiwake Flapping Lesser black-backed gull Flapping Great black-backed gull Flapping Herring gull Flapping **Upwind Flights (%)** Gannet 50	In response to the ExA's request to present CRM figures using the avoidance rates in Bowgen and Cook (2018) Natural England note: The Applicant stated in REP6-042 that "*It should be noted that JNCC have just revised their advice on avoidance rates in light of the ORJIP study (Bowgen and Cook (2018), report included in Appendix 14) and the rates recommended in this report have also been presented*." Natural England note that JNCC have not revised their advice on avoidance rates in light of the ORJIP study or the analysis presented in the Bowgen and Cook (2018) report. 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), as provided in advice to Hornsea Three through the Evidence Working Group process, Scoping and PEiR stages of the Application as well as to other projects currently in the planning system, such as Norfolk Vanguard. Natural England additionally note that the avoidance rates listed by the ExA do not include standard deviations. SNCB guidance on the use of avoidance rates in CRM specifically advises that "*Collision mortality estimates should be presented using the mean total avoidance rate (as detailed in Table 1 below) as well as a range of avoidance rates that reflects the variability and uncertainty linked to it (i.e. ±2SD)"* JNCC et al (2014). Failure to account for this variability and uncertainty means that it is not possible to assess the range of potential mortality resulting from collisions, or the significance of the resulting population level impacts. Natural England also note that the Avoidance Rates listed by the ExA contain a mixed selection of rates taken from Bowgen and Cook (2018) some of which refer to the Basic Band model and some to the Extended Band model in Bowgen and Cook (2018). Natural England considers that it is confusing to present these numbers with no information about

Kittiwake 50 Lesser black-backed gull 50 Great black-backed gull 50 Herring gull 50 **Flight Height Proportions** Gannet Option 1 Kittiwake Option 1 Lesser black-backed gull Option 3 (Johnston et al. 2014) Great black-backed gull Option 3 (Johnston et al. 2014) Herring gull Option 3 (Johnston et al. 2014) As in the original analysis [APP-109], the 35m band as well as the combined 35m and 30m band should be analysed from the boat-based surveys to provide a precautionary estimate. **Flight Speed** Gannet 14.9 m/sec (Pennycuick et al. 1987) Kittiwake 13.1 m/sec (Pennycuick et al. 1987) Lesser black-backed gull 13.1 m/sec (Alerstam et al. 2007) Great black-backed gull 13.7 m/sec (Alerstam et al. 2007) Herring gull 12.8 m/sec (Alerstam et al. 2007) **Avoidance Rates** Gannet 0.995 (Bowgen and Cook 2018) Kittiwake 0.990 (Bowgen and Cook 2018) Lesser black-backed gull 0.993 (Bowgen and Cook 2018) Great black-backed gull 0.993 (Bowgen and Cook 2018) Herring gull 0.993 (Bowgen and Cook 2018) **Nocturnal Activity Factors** Gannet 1-2 (Furness 2018/Garthe & Hüppop 2004) Kittiwake 2-3 (Furness 2018/Garthe & Hüppop 2004) Lesser black-backed gull 3 (Garthe and Hüppop 2004) Great black-backed gull 3 (Garthe and Hüppop 2004) Herring gull 3 (Garthe and Hüppop 2004)	what they refer to, or any context to explain why, for example, a rate that applies to the Basic Band Model is listed for kittiwake but a rate that applies to the Extended Band Model is listed for Herring gull. In response to the ExA's request regarding "Flight Height Proportions": Natural England note that the flight height proportions are not specified by the Band Model Options (e.g. Option 1 or Option 3). The Band Model option only specifies whether the collision risk model requires the user to input a site specific proportion of birds at collision height (for Option 1) or whether the model will calculate a height based collision risk from a flight height distribution that is added to the "*Flightheight*" worksheet of the Band Model workbook. Natural England note that the ExA's comment about the boat-based surveys implies that the ExA is asking the Applicant to derive a proportion of birds at collision height (as would be required for use with Option 1) from the boat based survey data that the Applicant used in APP-109. Natural England further notes that the ExA is asking the Applicant to run the CRM using the "*35m band as well as the 30m and 35m band combined*". The turbine parameters documented in APP-109 indicate that the lower rotor tip is predicted to be between 31.97 and 34.97 metres above sea level depending in tidal state. The Applicant states in APP-109 that the 35 metre flight height band has been included to calculate the proportion of birds at PCH. Since the boat based data were collected in 5m height bands the Applicant has assumed that boat based observers considered that birds recorded in the 35 m band were in fact flying between 32.5m and 37.7m above sea level. The Applicant also used information on the number of birds flying in the 30m band (which the Applicant assumes represents birds flying between 27.5m and 32.5m above sea level) to calculate a PCH value that the Applicant used to provide a "*upper confidence*" PCH in APP-109.

Please use the wind farm parameters, as defined in Table 1.4 of the ES [APP 109] for the initial analysis and then increase the rotor tip height to 37.5m and 40m above LAT for subsequent runs in order to evaluate the effect of the mitigation that was proposed at ISH7. Please use the results of the analyses to refine the population viability analysis for each species and conclude on whether the potential collision impacts would lead to an adverse effect on the integrity of the Flamborough and Filey Coast SPA either alone or in combination with other plans or projects for relevant species. This evaluation should be based on the following assumptions: **Apportioning** Gannet Post-breeding 4.8% Breeding 63.3% Pre-breeding 6.2% Kittiwake Post-breeding 5.4% Breeding 41.7% Pre-breeding 7.2% **Seasonality** Gannet – Breeding March-September (Furness 2015) Gannet – Non-breeding October-February (Furness 2015) Kittiwake – Breeding March-August (Furness 2015) Kittiwake – Non-breeding September-February (Furness 2015) Please set out whether the above parameterisation and assumptions alter the conclusions of the ES and the RIAA and to what extent the proposed increases in rotor tip height might mitigate any negative impacts. If the Secretary of State were to conclude that an increase in rotor tip height would represent appropriate mitigation, could that be secured by amending the dimension in Requirement 2(2)(c) and in the corresponding design parameters in the Deemed Marine Licences?	It is not clear whether the Applicant has used all records of birds in flight in the 30m and/or 35m and above bands to generate PCH values (as in previous assessments of the boat based data from the Hornsea Zone the numbers of birds in different bands have been reduced based on the proportion of the height band that the rotor height overlapped with). The respective PCH values of including the 35m band or the 30 + 35 m bands are 0.78% and 1.14% for kittiwake and 1.41% and 4.23% for gannet [APP-109]. Natural England have not seen the data used to derive PCH values for Hornsea Project Three, but Natural England understands that the Applicant derived PCH values from boat based survey data collected between 2010 and 2013 from transects that overlapped the HOW3 +4km buffer area. Natural England provided extensive comments regarding our concerns about the Hornsea Project Zone boat-based datasets during the Hornsea Project 2 examination. These are documented in our Hornsea Project Two Relevant Representations (Appendix 1, paragraphs 24-30) and Written Representations (paragraph 6.5.34 – 6.5.37) and in our Hornsea Project 2 Deadline 5 Written representation paragraphs 3.22-3.46. In summary our concerns are: 1. About the accuracy with which boat based observers can record birds in flight to the nearest 5m height level; 2. About the false precision resulting from assignment of birds in flight to height bands (0-2.5m, 2.5-7.5m, 7.5-12.5m, 12.5-17.5, 17.5-22.5, 22.5-27.5, 27.5-32.5 etc); 3. About how the data in the 5m bands were processed to generate PCH values aligning with specific turbine rotor heights; 4. About a lack of information regarding what the boat based observers recording protocol actually was. The baseline survey data for seabirds at Hornsea Project One and Two were collected using boat based observers. Birds in flight were recorded using a snapshot method which involves observers making an

Would any consequential amendments be required?	instantaneous record of all birds flying over the transect and within 300m distance ahead of the ship, at survey intervals of one minute as the boat moves along the transect line. Natural England were not able to get clarification during the Hornsea Project Two examination about the exact methodology that was used to collect flight height data. According to Smartwind 2015[1] "*A snapshot method was used for flying birds, which takes the ship's speed into account and prevents overestimation of seabird densities. In addition, the estimated height of flying birds was also recorded, to the nearest 5 m. The count interval for surveys was one minute, and synchronised GPS recorders were used to record the vessel position every minute*". It is not clear from this description of methods whether observers on the boat were recording birds in the five metre bands listed by the Applicant (e.g. 0-2.5, 2.5-7.5m, 7.5-12.5m, 12.5-17.5m, 17.5-22.5m, 22.5-27.5m etc.) or alternatively were recording birds to the nearest 5 m (e.g. 5m, 10m 15m 20m etc.) and these were then subsequently post-processed such that, for example, birds recorded as flying at 20m were assigned to a 17.5-22.5m category. At Hornsea Project Two Natural England considered that "*in designing a boat based survey protocol it would be unusual to instruct surveyors on a boat to collect and record data in height bands that include 0.5m boundary categories (such as to record birds in a 17.5 – 22.5 m height band), suggesting that the survey data was processed into these bands post collection*". Irrespective of this, Natural England does not consider that boat based observers can accurately assign flying birds into five metre height categories: Natural England Relevant Reps (HOW2):

[1] SMartWind (2015). Hornsea Offshore Wind Farm Project Two Environmental Statement Volume 5 - Offshore Annexes Chapter 5.5.1 Ornithology Technical Report. Part 2. PINS Document Reference: 7.5.5.1 APFP Regulation 5(2)(a), January 2015.

	Preliminary data from a project undertaken for the Marine Renewables Ornithology Group (MROG, comprising the Joint Nature Conservation Committee (JNCC), Natural England (NE), Natural Resource Wales (NRW), Northern Ireland Environment Agency (NIEA), Scottish Natural Heritage (SNH), Marine Scotland Science (MSS) and the Royal Society for the Protection of Birds (RSPB)) involving a field trial using a hexocopter at known height, showed that boat based observers were only able to place the hexocopter in the correct 5m height band on 19% of occasions and that 59% of the incorrect flight band allocations were underestimates (i.e. observers placed the hexocopter in a lower 5m height band than the hexocopter was actually in). These were preliminary trials and a further trial is planned to confirm the results. The trial involved observers only having to record the height of a single object whereas boat based observers undertaking baseline surveys are required to count all birds present in the snapshot as well as identify the species, the flight height of all individuals and record behavioural information such as direction of flight and foraging behaviour. This is alongside the recording of birds on the water, all at one minute intervals. Furthermore, collection of flight height data in 5m height bands is not standard practice for boat based observations. Typically boat-based observers assign birds to much coarser flight height bands such as 0 - 20m, 20 - 150m, and above 150m, equating to "below rotor sweep", "within rotor sweep" or "above rotor sweep". Due to the uncertainty in the flight height data collected for the Hornsea Project Two, Natural England advised Hornsea Project Two that Band Model Options (such as Option 2) which use generic flight height distribution data, and allow incorporation of upper and lower confidence limits around the flight height data, should be used for assessing collision risk for the project. Natural England's position regarding the analysis and use of flight height data boat based survey data from the Hornsea Project Zone applies to Hornsea Project Three, and for this reason we do not consider that

	Option 1 should be used for collision risk modelling and that Option 2 should be used. This is consistent with advice given to other offshore windfarm projects where there have been issues with the site specific flight height data.