Hornsea Offshore Wind Farm

Project Two

Applicant's response to EOO2 – Extended response

Appendix M to the Response submitted for Deadline I
Application Reference: EN010053

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(a) In their S42 response Natural England queried from which of the wind farm areas (e.g. Hornsea Zone, Subzone 2) and associated timeframes, data were used to inform the derivation of global detection functions used as part of Distance analysis and requested further information on the Distance analysis methodology. The Applicant outlined that the data used to inform the calculation of global detection functions incorporated data from all data sets including Subzone 2 and the wider Hornsea Zone with this considered to be the most appropriate approach as it provided the greatest sample size whilst maintaining a consistent survey approach. Agreement on this point was reached at a workshop between the Applicant and Natural England on the 20th August 2014.

For birds in flight, Natural England, as part of their Section 42 response, queried the method used to calculate population estimates. The Applicant stated that raw data observations for birds in flight were subject to Generalised Linear Modelling (GLM) in order to calculate upper and lower confidence limits. The Applicant circulated information (7th October 2014) to Natural England that demonstrated that there was very little difference between mean values calculated using GLM and those calculated using a standard more basic approach (differences were normally distributed and centred on zero). Natural England confirmed on the 15th January 2015 that this issue could be closed.

Further issues relating to the calculation of population estimates (and densities) were raised in Natural England's Relevant Representation. In particular, Natural England stated it was not clear how population estimates had been extrapolated from raw data. These issues have been addressed during further consultation meetings with Natural England (30th April and 3rd June 2015) with a resulting clarification note (titled Offshore Ornithology baseline data clarification note) submitted as Appendix L to the Applicant's response to Deadline I. This clarification note provides the raw data that was incorporated into Distance analysis and GLM for all survey areas used in subsequent assessments and explains the apparent discrepancies noted by Natural England.

In Natural England's Section 42 response the differences between data calculated for Hornsea Project One and the Project were highlighted. The Applicant explained that any apparent differences were due to the areas that were incorporated into analyses (Subzone 1 or Subzone 2) and the datasets that were incorporated into the calculation of population estimates.

(b) The Habitats Regulation Assessment: Evidence Plan for this Application (Doc ref No. 12.6.1) specifies the surveys that were undertaken to inform the baseline and (Appendix A3 of that agreed plan) notes that surveys were incomplete for some months in the winter period due to adverse weather and short day-lengths. The Applicant

maintains their view that the baseline surveys provide a robust baseline against which impact assessment can be conducted.

The Applicant does note however that Natural England made queries in their Relevant Representations in reference to the level of survey coverage during baseline boat-based surveys. The Applicant developed, in consultation with Natural England, a scope of work for addressing these queries which have subsequently been presented in the Ornithology baseline survey coverage of Project 2 Clarification Note submitted as Appendix K to the Applicant's response to Deadline I.

This Clarification Note investigated the representativeness of population estimates and densities calculated from data collected in months considered by Natural England to have an incomplete level of survey coverage. The following conclusions have been drawn:

- Population estimates and densities calculated for the Year 2 November survey can be considered to be representative of razorbill abundance within Subzone 2 and 2 km buffer;

- Survey coverage of Subzone 2 and 2 km buffer during the November Year 2 survey was 77.1%;

- The seasonal trends in population estimates evident at Project Two in Year 2, are consistent with the seasonal trends in abundance of razorbill at other offshore wind farm projects in the North Sea; and

- There is no indication that the density of birds is likely to be higher in the western part of the Subzone than they are in the eastern part outside of the breeding season.

On this basis, the Applicant considers that the assumptions made in the assessment with respect to incomplete survey months are reasonable.

As stated in Table 4.1, paragraph 11-15 of the SoCG this issue is still under discussion between the Applicant and Natural England pending receipt of Appendix K of the Applicant's response to Deadline I.

(c) Natural England, in their Relevant Representations stated it was not clear how the proportioning of unidentified birds to species level had been undertaken within the Applicant's assessment. Information regarding the treatment of unidentified birds was provided to Natural England on the 11th May 2015. This outlined the methodology used to apportion unidentified birds to species level and was discussed at a consultation meeting with Natural England on the 3rd June. Appendix K (Ornithology baseline survey coverage of Project 2 Clarification) of the Applicant's submission at Deadline 1 includes raw data that incorporates unidentified birds that have been proportioned to species level.

On this basis, the Applicant considers that the assumptions made in the assessment with respect to unidentified birds are reasonable.

(d) Issues relating to the flight height data collected during boat-based surveys have been raised by Natural England as part of both their Section 42 response and Relevant Representations.

In the Section 42 response, issues were raised in relation to the data used to derive PCH values and the accuracy of PCH values.

In response to the issues raised by Natural England, a hierarchical approach to the calculation of PCH values for relevant species was developed incorporating data from either Subzone 2 transects or Hornsea Zone transects depending on the sample size associated with these two datasets. Natural England were in agreement with this approach, where applicable.

The issues raised in Natural England's Relevant Representation concentrated on the collection of flight height data, specifically the fine resolution of data collection, the post-processing of data and the variability and uncertainty associated with these data.

The Band (2012) collision risk modelling (CRM) guidance states that where possible site-specific data should be used to inform CRM. Appendix J 'Collision Risk Modelling: Addressing Uncertainty' Clarification Note of the Applicant's submission at Deadline I discusses the accuracy of the flight height data collected during boat-based surveys at Project Two with the text below an excerpt from this note:

"The extensive boat-based survey programme for Project Two was carried out in accordance with standard industry guidance. These surveys yielded abundant data that is considered fully adequate to robustly characterise the flight height behaviour of birds for the purpose of collision risk assessment. PCH values for Subzone 2 transects have been calculated on an annual basis in order to provide a sample size that is sufficient to provide an accurate representation of bird behaviour at the site. A total of 100 individual species records has previously been considered sufficient to allow for the calculation of PCH values considered representative of bird behaviour (Natural England, 2013).

Flight height data was collected in five metre bands and it is considered that resolution to this scale does not undermine confidence in the resulting PCH values. The key aspect of the calculation of a PCH value are those height bands which intersect with the lower rotor height. Errors in the recording of flight height at this point can result in under or over-estimations of PCH. However, the use of 5 metre resolution height bands does not increase the likelihood of such errors.

The use of finer resolution height bands has the potential to increase confidence in associated PCH predictions. For example, if a seabird is assigned to the 0-2.5 metre flight height band there is considered to be a high degree of confidence that that bird is outside of the rotor swept area. If data were recorded in broad flight height bands that simply represented 'below rotor height', 'within rotor swept area' and 'above rotor height', this level of confidence is lost.

As is detailed in Section 1.2, the post-processing and calculation of PCH values is considered to be precautionary when knowledge pertaining to the vertical distribution of birds across water is considered.

Natural England also raise uncertainty in regards to the recording of flight height at mean sea level (paragraph 94, Appendix 1 of Natural England's Relevant Representations). However, it is standard industry practice to assume that all observations of flight height are recorded at mean sea level.

It is accepted that the Project Two PCH values for a number of species included in the assessment of collision fall outside of the confidence limits associated with PCH values presented in Johnston et al., (2014). However, there may be several explanations why this is so. Notably the Band (2012) guidance states the following in relation to generic flight height data from Cook et al. (2012) which preceded Johnston et al. (2014):

"<u>Caution is needed in deploying this generic data. It is entirely possible that the ecological circumstances of a particular site differ from those sites used to generate the generic data, and hence the bird behaviours and flight heights may not be well represented by the generic data</u>".

An example given by Band (2012) is the proximity of a project to breeding sites. Of the 32 projects from which data were obtained for use in Johnston et al. (2014), only one is an offshore site and therefore potentially comparable to Project Two. Secondly, the hypothetical turbine parameters used in Johnston et al. (2014) are not consistent with those used within CRM for Project Two and as such comparisons between the generic data and site-specific data are misleading.

In summary, it is considered that the PCH values obtained for Project Two are robust and are appropriate to inform Band Model Option 1."

This remains an area of disagreement between Natural England and the Applicant.

(e) Since the Section 42 response, the BDMPS population scales used for assessment have been updated following advice from Natural England and using information provided by Natural England on 23rd September 2014 relating to biological seasons and population scales which has been subsequently been included as part of Furness (2015).

On this basis, the Applicant considers that the data used to define BDMPS populations is appropriate and follows guidance issued by Natural England.

Natural England do not have any outstanding concerns regarding the population scales used within the assessment, this issue was not raised by Natural England in their relevant representation, see paragraph 3.2.1 of the SoCG, Appendix ZZ of the Applicant's submission at Deadline I.

(f) In their Section 42 response, Natural England recommended the use of the apportioning approach applied for the Dogger Bank Creyke Beck project. It was agreed at a consultation meeting on the 18th August 2014 that this approach would be implemented for the Project. The Applicant therefore followed this approach for the designated breeding populations of gannet, kittiwake, guillemot, razorbill and puffin at Flamborough and Filey Coast pSPA.

Natural England's Relevant Representations included a number of queries relating to the approach implemented for the apportioning of impacts to SPA populations. These queries mainly focussed on the proportion of immature and foreign birds assumed to be present at the Project during various seasons and the effect any changes would have on the resulting apportioning percentages. Discussions in relation to these points are currently ongoing between the Applicant and Natural England, further information on the progress of this issue can be found in Table 4.1 of the SoCG (Appendix ZZ of the Applicant's submission at Deadline I).

References

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