Hornsea Project Four

Applicant's Response to Natural England's comments on Auk Displacement and Mortality

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Prepared Sean Sweeney, APEM, April 2022
Checked Matt Boa, APEM, April 2022
Accepted Hannah Towner-Roethe, Orsted, April 2022
Approved Julian Carolan, Orsted, April 2022

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Revision Summary

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01	06/04/2022	Sean Sweeney, APEM Ltd	Matt Boa, APEM Ltd	Julian Carolan, Orsted

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Glossary

Term	Definition
Appropriate Assessment (AA)	An assessment to determine the implications of a plan or project on a European site in view of the site's Conservation Objectives. An AA forms part of the Habitats Regulations Assessment and is required when a plan or project likely to have a significant effect on a European site.
Displacement	The potential for birds and other animals to avoid an area due to the presence of the wind turbines or from vessel activity.
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
In-combination Effect	The combined effect of Hornsea Four in-combination with the effects from a number of different projects on the same feature/receptor.

Acronyms

Term	Definition
AA	Appropriate Assessment
AEoI	Adverse Effect on Integrity
AOS	Apparently Occupied Sites
BDMPS	Biologically Defined Minimum Population Scale
ES	Environmental Statement
HRA	Habitats Regulations Assessment
LSE	Likely Significant Effect
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
WTG	Wind Turbine Generator

1 Hornsea Four - Auk Displacement and Mortality Evidence Review

1.1 Hornsea Four – Review process and consultation

1.1.1.1 The Applicant presented a comprehensive review of the response to offshore wind farms (OWFs) by auk species, guillemot (*Uria aalge*) and razorbill (*Alca torda*), at Deadline 1 to the Examining Authority **G1.47: Auk Displacement and Mortality Evidence Review** (**REP1-069**). This document was submitted in support of the Applicant's assessment of potential impacts from displacement of auk species as a consequence of Hornsea Four as detailed in the **A2.5 Offshore and Intertidal Ornithology (APP-017)** and **B2.2: Report to Inform Appropriate Assessment (APP-167 to APP-178)**.

1.1.1.2 The report followed on from initial research into auk displacement undertaken and draft reports that the Applicant consulted on with Natural England and the Royal Society for the Protection of Birds (RSPB) through the Evidence Plan Process. Through this consultation process multiple variables were identified to investigate from post-consent monitoring studies in order to provide an evidence base in support of an updated approach to understanding auk displacement from OWFs. The compilation of study data from post-consent monitoring reports and associated OWF design metrics provided the opportunity to examine variables associated with displacement levels and consequent mortality effects on auk species beyond that undertaken within previous studies.

2 Natural England review of G1.47 Auk Displacement and Mortality Evidence Review Revision: 01 (REP2-085)

2.1 Natural England's response

2.1.1.1 Natural England's response (REP2-085) to the Applicant's **G1.47: Auk Displacement and Mortality Evidence Review** (**REP1-069**) were summarised as;

2.1.1.2 *'The re-evaluation of displacement rates and comparison with environmental variables and offshore wind farm design metrics is of particular interest. The report usefully highlights that the evidence base regarding OWF displacement is patchy and contradictory. Natural England observes that there are methodological issues with many of the studies cited, not just those reporting more significant displacement effects, not least the use of boat-based surveys, a survey methodology that is no longer considered fit for purpose.'*

2.1.1.3 *'Natural England advises that the information provided in the report does not provide justification for the use of single displacement (50%) and mortality (1%) rate values for the auks at Hornsea 4, and we advise that these values could underrepresent impacts on these species. The use of single values runs a significant risk of 'false precision', which is inappropriate given the range of responses apparently recorded and the limitations of the studies thus far carried out. Accordingly, Natural England's range-based approach seeks to encompass a range of potential displacement effects as observed in post-construction monitoring studies (30-70%) and mortality rates (1-10%) that reflect the considerable uncertainty relating to site-specific drivers for, and impacts of, displacement. We also highlight that the mortality rates are a simple way of attempting to capture a range of sub-lethal as well as lethal effects from*

displacement, e.g. adults entering the breeding season in poor condition.'

3 Hornsea Four's Justification for continued use of updated auk displacement values

3.1 Hornsea Four - Review findings

3.1.1.1 The Applicant's review, **G1.47: Auk Displacement and Mortality Evidence Review (REP1-069)**, highlights that multiple factor may be associated with the magnitude of a displacement effect and OWFs with similar attributes are likely to demonstrate similar displacement effects. There is a contrasting difference in three attributes: OWF layout, WTG density and marine traffic density, between OWFs reporting high displacement rates for auks and the Hornsea Four development site. Therefore, by considering OWF site attributes the displacement rate can be refined from the broad range reported across all OWFs and tailored to an individual development based on similar attributes known to effect displacement rate and thereby removing a high level of uncertainty.

3.1.1.2 One aim of the review process was to understand the origin and sources of the current range, of 30-70% displacement, advocated by Natural England. The findings of the review were that this range has been compiled regardless of the quality of the studies, source data or confidence in the derived displacement rate, therefore not meeting the high standards required to undertake impact assessments.

3.1.1.3 The range of 30-70% displacement also did not account for studies that showed no significant displacement effect or even attraction or habituation, leading to an inherent bias in their range.

3.1.1.4 The review process also identified multiple more recent studies that now allow for a more precise evaluation of data on auk displacement, so as to provide a new range for impact assessments, with a new upper level.

3.1.1.5 The outcome of the Applicant's review recommends a precautionary displacement rate of up to 50% for auks to be applied for the Hornsea Four OWF impact assessment, which is based on the most comprehensive evidence to-date. This takes into consideration weak displacement effects that may have gone undetected in studies that have reported no significant effects due to the power of the study to detect small changes. The confidence of auk displacement rates exceeding 50% is uncertain, however such levels may apply to specific OWF sites and environmental conditions, though applying these higher rates to other OWF sites such as Hornsea Four, are not justified based on evidence from developments with similar attributes.

3.1.1.6 Evidence for the mortality rate of displaced birds was also investigated in the Applicant's review, derived from two studies that predict the population level consequence of displaced seabirds, including auks, from OWFs using simulation models and a recent modelling study estimating changes in guillemot adult survival from OWF displacement. Empirical evidence was also sought from auk colony data to determine whether any changes have occurred to colony population trends since the operation of local OWFs in support of high mortality rates of up to 10%. The Applicant's review concluded that the empirical evidence supports mortality rates of considerably less than 10%, with 1% implied to be the most realistic (yet

still precautionary) rate to be applied in assessments of displacement for guillemot and razorbill.

3.2 Hornsea Four - Review recommendations

3.2.1.1 The Applicant's review of auk displacement and mortality provided significant new evidence as well as a review of older evidence to justify the use of an updated range for displacement (up to 50%) and mortality (up to 1%) rate for auk species assessed for Hornsea Four. The Applicant's use of a 50% displacement rate and 1% mortality rate followed the precautionary approach in the impact assessments for Hornsea Four, as it took the upper end of the range from the review of evidence for consideration.

3.2.1.2 It is also important to note that the review process also provided an understanding of the data sources for Natural England's range of 30-70% values for auk displacement, which are now proven to rely on data sources that would not meet the stringent tests set for use as evidence and are known to underrepresent the current evidence now available to determine impacts on these species. Equally, the Applicant's range-based approach to mortality levels, using a range of up to 1%, reflect the site-specific drivers for, and impacts of, displacement at Hornsea Four as detailed in the modelling approaches reviewed and anecdotal evidence from productive colonies in close proximity to OWFs.

3.2.1.3 Therefore, the Applicant retains that the use of the new ranges of up to 50% (not a single value) for displacement and up to 1% mortality (not a single value) for Hornsea Four provides more precision at an appropriate level to provide confidence to the examining authority, reducing uncertainty in the previous range-based approach presented by Natural England that relies on limited studies now proven to be less reliable.