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**Natural England's response to G5.34 Applicant's response to Natural England's additional guidance on apportioning of seabirds to FFC SPA for Hornsea Project Four [REP5a-018]**

For:

The construction and operation of Hornsea Project Four Offshore Wind Farm, located approximately 69 km from the East Riding of Yorkshire in the Southern North Sea, covering an area of approximately 468 km<sup>2</sup>.

Planning Inspectorate Reference EN010098

27<sup>th</sup> July 2022

## Overview

The Applicant has provided a response [REP5a-018] to the additional guidance provided by Natural England at Deadline 5 [REP5-115] in relation to the assessment of guillemot and razorbill displacement impacts and apportioning to Flamborough and Filey Coast Special Protection Area (FFC SPA). Within this response the Applicant has made several assertions regarding why, in their opinion, Natural England's guidance is not fit-for-purpose.

Natural England does not agree with these assertions. Below, we provide clarifications and further evidence in support of Natural England's advice for consideration by the Examining Authority (ExA). In brief, Natural England advise the ExA that the additional guidance is in line with the Joint SNCB interim displacement advice. We consider that it is appropriate and proportional given the proximity of the site to the FFC SPA as the largest nearby seabird colony and the very high numbers of guillemot and razorbill recorded in the Hornsea 4 array area + 2 km buffer immediately after breeding compared to other Project areas. We note that there are numerous sources of uncertainty across the impact assessment and that it is necessary to adopt a precautionary approach in such instances. These uncertainties are set Annex I of our response to the Applicant's Ornithological Assessment Sensitivity Report [REP5-065].

We then conclude with an analysis of how the Applicant's approach to the auk displacement assessment influences the level of impact when compared to Natural England's advised approach.

## Natural England's Detailed Response to REP5a-018

### 1. Consistency with Joint SNCB advice on the assessment of displacement

The Applicant's characterisation that our advice is a departure from the Joint SNCB interim displacement guidance (2022) is inaccurate. The guidance is clear that seasonality in displacement assessments should be made on a case- and species-specific basis:

SNCB advice section – seasonality and summing across seasons: *“The ‘Matrix Approach’ should be applied to a minimum of two seasons (breeding and nonbreeding season) using mean seasonal peak abundance estimates for the OWF site (plus buffer). Where appropriate, additional matrix tables should be created for other discrete seasons (e.g. post breeding and migration periods for relevant species). However, **decisions regarding how to treat seasonality in any displacement assessment should be made on a site and species-specific basis, in discussion with SNCBs.**”*

**Natural England therefore consider our additional advice to be wholly in line with the Joint SNCB guidance (2022).**

### 2. Implications if the advice was applied to all OWF plans and projects

Natural England were careful to specify in our additional advice that it was **specific to Hornsea Project Four alone**. We have provided this advice due to the very high numbers of auks recorded in the area during August and September (see Section 3) and because of its proximity to FFC SPA, for which these species are designated features. **Natural England have in no way implied that this approach to the assessment of displacement and apportioning should be applied to other plans or projects within the North Sea.** Instead,

we will continue to consider each plan/project on a case-by-case basis and use the SNCB generic advice unless there are good reasons (such as those for Hornsea Four) for departing from it.

Natural England has raised concerns about the significant number of auks recorded during August and September in the Hornsea Four project area since the pre-application stage. We have previously advised the Applicant of the potential need for a bespoke approach to the HRA assessment, as well as an evidence review of auk dispersal patterns etc to inform it. However, no solution was provided other than a novel method that Natural England had advised was not agreed with during pre-application discussions. The approach departed from SNCB guidance, and we did not agree with it on the grounds that the 'weighting' would downplay any peaks in auk abundance in the non-breeding period. In the specific case of Hornsea Four, we considered that this approach was likely to significantly underestimate the potential importance of the chick rearing/moult period for guillemot, and that a bespoke apportioning approach had not been considered for razorbill. These concerns were raised in our Relevant Representations [RR-029] and are logged in the Natural England Risk and Issues Log (points B28, B33, B50, B51, B67, B73 and B77).

The Applicant maintained that their approach is suitable during the early stages of Examination, Natural England therefore looked to provide additional bespoke guidance for Hornsea Four to allow progress on this matter.

### **3. Significance of seasonal peak compared to other North Sea offshore wind projects**

The Applicant has asserted that similar peak numbers are apparent across the wider post-breeding migration season (July to October) in historic and recently consented offshore wind farm (OWF) projects in the North Sea and point to evidence provided in G5.7 Indirect Effects of Forage Fish and Ornithology [REP5-085]. However, we note that the data presented in REP5-085 clearly indicates that guillemot abundance estimates within the Hornsea zone are, in general, substantially higher than recorded in other OWFs during this period (acknowledging that these abundance estimates are partly a function of the size of the respective array areas).

To further illustrate the significant numbers of auks present at Hornsea Four at this time, Figure 1 below provides the mean abundance estimates for Hornsea Four based on the revised and now agreed baseline characterisation. The mean estimates of guillemot abundance (2016-2017) for Hornsea Four alone range from 6,348 in October (26.5% of the mean zonal estimate) to **31,690 in August** (19.3% of the mean zonal estimate).

For razorbill, the mean abundance estimates (2016-2017) range between 49 in July (0.2% of the mean zonal estimate), **2,410 in August** (4.6% of the mean zonal estimate), and **2,219 in September** (37.2% of the mean zonal estimate).

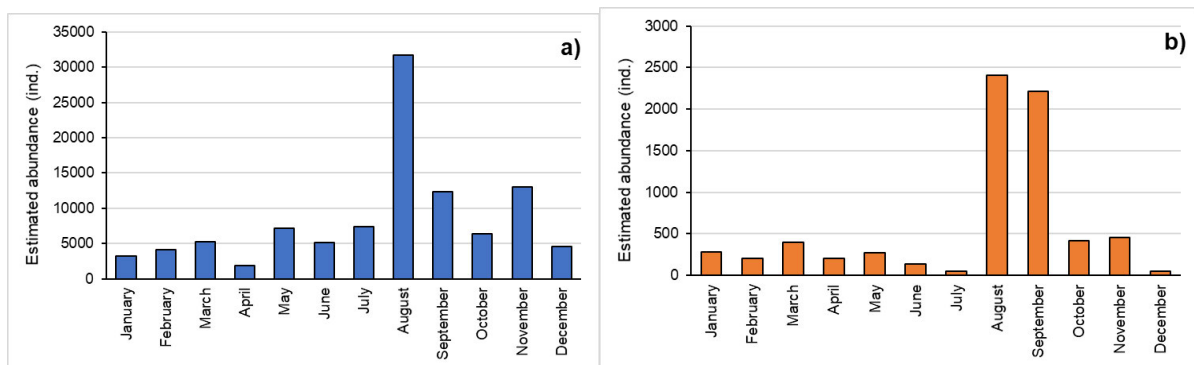
To inform a comparison of the guillemot numbers recorded in other North Sea OWF, we draw the ExA's attention to the Hornsea Four submission document '*Table 46: Cumulative bio-season and total abundance estimates for guillemot from-all Tier 1 & 2 projects for the North Sea and English Channel*' in [EN010098-001625-Hornsea Project Four - Other- G5.25 Ornithology EIA and HRA Annex.pdf \(planninginspectorate.gov.uk\)](#) [REP5-078].

OWF sizes vary and therefore comparisons are not straight-forward. However, we highlight that with the exception of a single Scottish OWF project, the Hornsea Four site supports significantly larger mean peak populations in the non-breeding season than all other North Sea OWF projects to date, including all English Round 3 projects. The Hornsea Four values

presented in this table have been superseded by MRSea\_v2, however as noted above using the standard, non-weighted mean peak approach, the correct abundance value for guillemot at Hornsea Four is 31,690. We note that this total is:

- 2.4 times larger than the equivalent peak recorded at Hornsea Two, the nearest Round 3 project to Hornsea Four, with over 18,000 more guillemot present.
- 3.9 times larger than the equivalent peak recorded at Hornsea One, adjacent to Hornsea 2, with over 23,000 more guillemot present.
- Approximately 10,000 more guillemot than both Hornsea One and Hornsea Two totals combined.
- 78% larger than the total recorded at Hornsea Three, with over 13,000 more guillemot present.
- 40% larger than the totals of all four Dogger Bank OWF combined (Teesside B having been renamed Sofia), and nearly three times the size of the largest of those projects.

**Natural England does not see how an objective analysis can conclude that the numbers of guillemot recorded in the Hornsea 4 array area are unexceptional.**



**Figure 1. Mean abundance estimates for guillemot (a) and razorbill (b) for the Hornsea Project Four array and 2 km buffer, derived from model-based and design-based methods respectively.**

We highlight that these mean peak numbers are following the Developable Area Approach (DAA), which removed the areas of highest density of seabirds from within the Hornsea 4 part of the Hornsea zone. This commendable approach has done much to mitigate the potential displacement impacts that could occur. Nevertheless, it is inescapable that significant numbers of auks remain.

To put these values into context, the latest colony count at FFC SPA (2017) for guillemot suggested approximately 121,754 adults were present with the potential to produce around 43,600 young (productivity of 0.716). This means a potential total of approximately 165,500 flightless birds dispersing from the colony in July and moving into the North Sea. **The mean peak guillemot numbers seen at Hornsea Four in August could therefore represent up to 20% of the entire FFC SPA population, with a worst case, based on the peak in August 2017 (52,700 individuals in the array + 2 km buffer), of up to 32% of the population.**

Similarly for razorbill, the latest colony count at FFC SPA (2017) suggested around 40,500 adults were present, with the potential to produce around 12,982 young (productivity of 0.641). This is a potential total of approximately 53,500 flightless birds dispersing from the colony in July. **The mean peak razorbill numbers in August could therefore represent up to 4.5% of the entire FFC SPA population, with a worst case, based on the peak in August 2017 (4,750 individuals in the array + 2 km buffer), of 9% of the population.**

Natural England is therefore not disputing that this period is a time of peak numbers for multiple Projects, as is to be expected at this time of year given the overall number of birds. **The key point is, as demonstrated by the Applicant's data in REP5-085, REP5-078 and shown in Figure 1, the peak guillemot numbers at Hornsea Four during this period are in general considerably larger than those observed at other Projects.** We consider the size of that peak is very likely related to the proximity of the FFC SPA colony (as discussed in Section 4) and the presence of suitable conditions for chick-rearing/moulting (discussed further in Section 5).

The Applicant also notes that Natural England do not recognise the presence of immature or sabbatical birds when considering apportioning. This overstates the case. We acknowledge that these birds should be a consideration, however there is currently no evidence relating to the proportions of immature/sabbatical birds present in the Hornsea Four area. Furthermore, given the sites proximity to FFC SPA, it is likely that even if they are not adult breeding birds, they may be associated with the colony in some way (e.g. prospecting prior to breeding the following year, failed breeders or skipped breeders from the colony). Thus, impacts on these birds may still influence the colony, although there is currently no means of modelling these more complex population processes and empirical evidence of appropriate fractions within the population is unavailable.

#### **4. Degree of mixing of birds from other guillemot and razorbill colonies**

Natural England has already acknowledged the potential for mixing with birds from other colonies to the North during August and September at Hornsea Four. However, we highlight that the other nearest large colonies are the Farne Islands (~230 km away) and Scottish colonies at >275 km away and tracking data suggests that, *contra* the assertions of the Applicant, Hornsea Four would be at the far reach of the likely dispersal extent of birds from these colonies in August and September (Buckingham et al., 2022; St John Glew et al. 2018). Whilst a proportion of the birds from these colonies may be present, we consider it unlikely that these will contribute a large proportion to the Hornsea Four area during the peaks in August and September. **Natural England therefore maintain that as the nearest large colony, FFC SPA (~70km) is likely to be the source of the vast majority of birds encountered at Hornsea Four in August and September.** We have therefore included a precautionary provision of 10% of birds being from other colonies in our guidance.

We note that the Applicant also deploys modelled data from Cleasby et al (2018) and Wakefield et al (2017) in 2.1.1.5 to suggest that the Hornsea Four array falls outside 'the key foraging area' for auks. They attempt to do so by using the predicted distributions of birds and foraging ranges from the FFC SPA colony during the breeding season to portray the Hornsea Four area as being relatively unimportant in August and September, because it falls outwith this modelled distribution. We advise that these breeding season data are not relevant to the distribution of guillemot and razorbill in August and September, because they are no longer 'central-place foragers' by this time of year. This means they are less tied to the colony by the need to regularly return to it to feed their chicks.

#### **5. Timing and importance of chick attendance and moult**

The moult period is an important time for both adults and juveniles, as they must prepare for the winter and are heavily reliant on areas of good prey availability (Ellis & Gabrielsen 2002, St John Glew et al. 2018, Dunn et al. 2019, Dunn et al 2020, Christie 2020, Merkel et al. 2021,

Buckingham et al. 2022). Further, these species may be particularly vulnerable to marine threats during moult as they are unable to respond rapidly to disturbance and are already expending energy on moult and/or parental care (Buckingham et al., 2022). Indeed, it has been noted that, given the increasing pressures on the marine environment from multiple anthropogenic activities, research is needed to quantify the foraging location and diet of birds that are moulting and may be sensitive to environmental conditions (St John Glew et al. 2018). Such information is required to effective conservation and marine spatial planning (Grecian et al. 2010, Lewison et al. 2012, JNCC 2015, MMO 2015).

The Applicant has suggested that the post-breeding aggregations are likely to be short-lived and take place mainly in July, rather than August and September. For clarity, the flightless moult period for guillemot and razorbill is widely accepted as being from around the end of July through to September (Birkhead & Taylor 1977, Harris & Wanless 1990). Natural England agree with the Applicant that the dispersal period for adults and dependent chicks is likely to begin in mid to late July (Camphuysen 2002, Harris et al. 2015, St John Glew et al. 2018, Dunn et al. 2020), but we note that the timing of this could vary between years. Regardless, these chicks will remain with the adults for approximately two months (Varoujean et al. 1979, Gaston & Jones 1998), into August and September (see Camphuysen (2002) for observations of father-chick pairs). Furthermore, juveniles may remain vulnerable even once developed and no longer attended by an adult.

We note that Tables 3 – 6 in G5.7 Indirect Effects of Forage Fish and Ornithology [REP5-085] show peak abundance occurring later at Dogger Bank than within the Hornsea Project Four area, likely reflecting the time taken for birds to disperse and reach important over-wintering foraging grounds. This dispersal, whilst unfortunately not documented through tracking datasets from FFC SPA (due to difficulties deploying tags on birds there), is also demonstrated in wider modelled datasets of guillemot and razorbill abundance in UK waters (Waggitt et al. 2019). Whilst relatively coarse, these modelled distributions clearly show how these species are more strongly tied to the colonies during the breeding season, including July, followed by initial dispersal away from the colonies in August and September; with distributions remaining more consistent in October and November.

The Applicant has also noted that adults with attendant chicks may look to avoid patches of intense foraging activity (Camphuysen 2002) and travel rapidly away from the colony. However, Camphuysen (2002) also describes the distribution of guillemot father-chick pairs in August and September as thin and wider spread, but with a tendency of higher numbers near the coast of England. Moreover, there is conflicting information on the dispersal rates of father-chick pairs, with some work suggesting they disperse more slowly than females (Gaston & Jones 1998). Further studies are needed to fully understand post-breeding movements of the auks and relative importance of specific areas within the North Sea.

Site-specific data for Hornsea Four is cited by the Applicant as a means of suggesting that adult males and attendant chicks/juveniles disperse rapidly through the area. However, we note that there is considerable uncertainty regarding the detection rates of chicks/juvenile birds based on the Digital Aerial Survey (DAS) method, particularly as when they grow and become more independent they are harder to discriminate from adults: so a decrease in detectable juveniles is not unexpected. Within the available ageing data for the array and 4 km buffer, there appears to be variability in the timing of what are presumably adult-juvenile pairs being present within the surveys (Table 1). In both years, the observations of juvenile guillemot were mainly in July. However, in 2017, some juveniles were noted in August, when the largest numbers of guillemot were recorded. For razorbill, there was only a single record of a juvenile in August.

**Table 1. Ageing data for guillemot and razorbill from A5.5.1 Offshore and Intertidal Ornithology Baseline Characterisation Report [APP-074] submitted at DCO Application.**

Species	Year	Month	Count	Adult	Immature	Juvenile	% Juveniles
Guillemot	2016	June	980	33	0	33	3
		July	983	95	0	97	9.9
	2017	July	512	72	1	72	14.1
		August	5,814	36	0	35	0.6
Razorbill	2017	August	541	1	0	1	0.2

Natural England consider that guillemot and razorbill may be more vulnerable to the potential impacts of displacement during the chick rearing/moult period. We consider that this period collectively runs from the middle of July through to the end of September but note that this may vary between years. There is a high level of uncertainty and very limited empirical information regarding how prolonged exposure to the presence of the wind farm will be and how individuals will react to it, and how. It is also not known whether there will be habituation or whether any indirect effects that may occur will be negative or positive in nature. Given this uncertainty it is appropriate to adopt a precautionary approach to the potential level of impacts.

## 6. Potential factors influencing the importance of the Hornsea Four array area

At Deadline 5 the Applicant submitted a report on the potential for indirect effects of the project on the Flamborough Front, forage fish and seabirds [REP5-085]. Within this report the Applicant suggests that based on historic boat-based surveys of the Hornsea Zone (2011-2013), there was no evidence of distributions reflecting the potential position of the Flamborough Front or being presented in higher numbers in the vicinity of the Hornsea Four area during the post-breeding migration. We consider these data have some use in relation to razorbill, that are present in relatively low numbers, where the raw data distributions are presented for the post-breeding period. However, the maps that the Applicant references for guillemot provide the overall distribution of observations across the entire non-breeding season. We therefore advise that no conclusion can be drawn about the wider distribution of guillemot during August and September based on this data. We note that no specific analysis has been undertaken relating to the wider distribution of guillemot and razorbill within the Hornsea Zone that provides evidence of the conclusions drawn by the Applicant that distributions do not imply a link with the Flamborough Front.

REP5-085 ultimately concludes that there may be some correlation between the location of Flamborough Front, forage fish abundance, fishing activity and the presence of seabird aggregations exploiting the resources within the area around Hornsea Four. This seems likely to be the case. Natural England would again highlight the proximity of FFC SPA to the Hornsea 4 area as being an important driver of auk aggregations in the chick-rearing/moult phase.

Further, Natural England also note that whilst there is separation between the Hornsea Four area and Hornsea 1 and 2 projects, displacement from these other nearby offshore wind farms may place further pressure on an area that is already important. Surveys of the Hornsea Four

area were not undertaken following the beginning of construction of Hornsea 1, and it is unclear how this may have influenced the use of the Hornsea Four area by guillemot and razorbill during these peak periods. In other words, the displacement impacts of Hornsea Four in-combination with other OWF projects may have spatial and temporal considerations that are not easily captured in the assessment. Further, should birds be displaced from Hornsea 4, it is plausible that they would effectively be forced to compete with others in the higher importance areas that have been excluded from the project envelope during the DAA.

Natural England therefore consider that, whilst the remaining Hornsea Four array + 2 km buffer area may not represent the most important area for guillemot and razorbill within that surveyed, it remains an area of high usage and importance during August and September. The factors driving this are unclear, other than at a gross level – proximity of the array area to the FFC SPA, broad location of the Flamborough Front, likely presence of prey resource.

We also note that there are uncertainties associated with the detection of peaks, interannual variations, and the duration of the peak use, all of which are compounded by the inevitable ‘snapshot’ nature of at-sea bird surveys. This means some caution is needed in interpreting seabird distributions

**We consider the potential impacts resulting from the project to represent a significant risk to significant numbers of guillemot and potentially razorbill at a sensitive time of year, and therefore consider that a precautionary bespoke approach to the assessment of the potential impacts is appropriate.**

## 7. Consequences of Different Approaches for the Impact Assessment

The Applicant’s ‘weighted’ approach to seasonality for guillemot produces total mean peak abundance estimates that are significantly lower than both the generic SNCB approach to displacement assessments, and the Hornsea Four bespoke approach advocated by Natural England. This is shown in Table 2. The Applicant’s approach results in an abundance estimate that is 33,601 individuals smaller than if the Natural England bespoke method is used (approximately half the size), and 16,644 less than would have been produced if SNCB generic guidance was used. The Applicant’s approach therefore substantially reduces the number of guillemot that the displacement assessments for EIA and HRA then utilise. We repeat our advice that this approach is not appropriate.

**Table 2. Variation in mean peak abundance estimates for guillemot based on the three different approaches. Numbers derived from G5.25 Ornithology EIA and HRA Annex.**

Season	SNCB generic approach to guidance approach to seasonality	Natural England bespoke method	Applicant’s weighted approach
Breeding (agreed)	9,382	9,382	9,382
Chick rearing/moult	0	36,965	0
Non-breeding	36,965	16,962	20,326
<b>Total annual</b>	<b>46,347</b>	<b>63,309</b>	<b>29,708</b>

For HRA, the Applicant’s approach utilises both non-breeding weighted mean peak abundance estimates, a weighted approach to apportioning and includes reductions due to sabbaticals, none of which are supported by Natural England. The difference between Natural



England's bespoke approach and the Applicant's approach is pronounced (a four-fold increase). This is due to Natural England's position that the high peaks observed during the chick rearing/moult are likely to be mainly comprised of birds from FFC SPA, and that these peaks occur at a time of high sensitivity, hence using a 5% mortality rate.

For razorbill, the additional advice on apportioning results in around an eight-fold increase relative to the Applicant's standard apportioning (Table 3). This again results from the increased apportioning of impacts in the post-breeding period when birds could be especially vulnerable to potential impacts, and the associated use of a 5% mortality rate.

**Table 3. Variation in mortality estimates based on the project alone, apportioned to FFC SPA on different assessment methods for guillemot and razorbill. Numbers derived from G5.25 Ornithology EIA and HRA Annex.**

Species	Method	Total (70% displacement and 5% mortality)	Total (70% displacement and 2% mortality)
Guillemot	Generic SNCB seasons and NE apportioning	385	154
	Addition of chick rearing/moult and NE's bespoke apportioning	1,131	452
	Weighted mean peak and apportioning (Applicant's approach)	277	111
Razorbill	Generic SNCB seasons and NE apportioning	20	8
	Standard seasons and NE's bespoke apportioning	114	46
	Applicant's apportioning	14	5

As well as the large numbers present in August and September, our bespoke advice for guillemot at Hornsea Four takes into consideration the sensitivity of the chick rearing/moult period, the proximity of the site to the FFC SPA and the available evidence around the mixing of birds from different colonies at this time of year. We highlight that this approach effectively brings the assessment in line with that advised by Natural England for razorbill, which also takes these factors into account. In contrast, Natural England are of the opinion that the Applicant's approach does not adequately capture the risks to guillemot and razorbill during the chick rearing/moult period and is therefore likely to significantly underestimate the potential impacts.

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