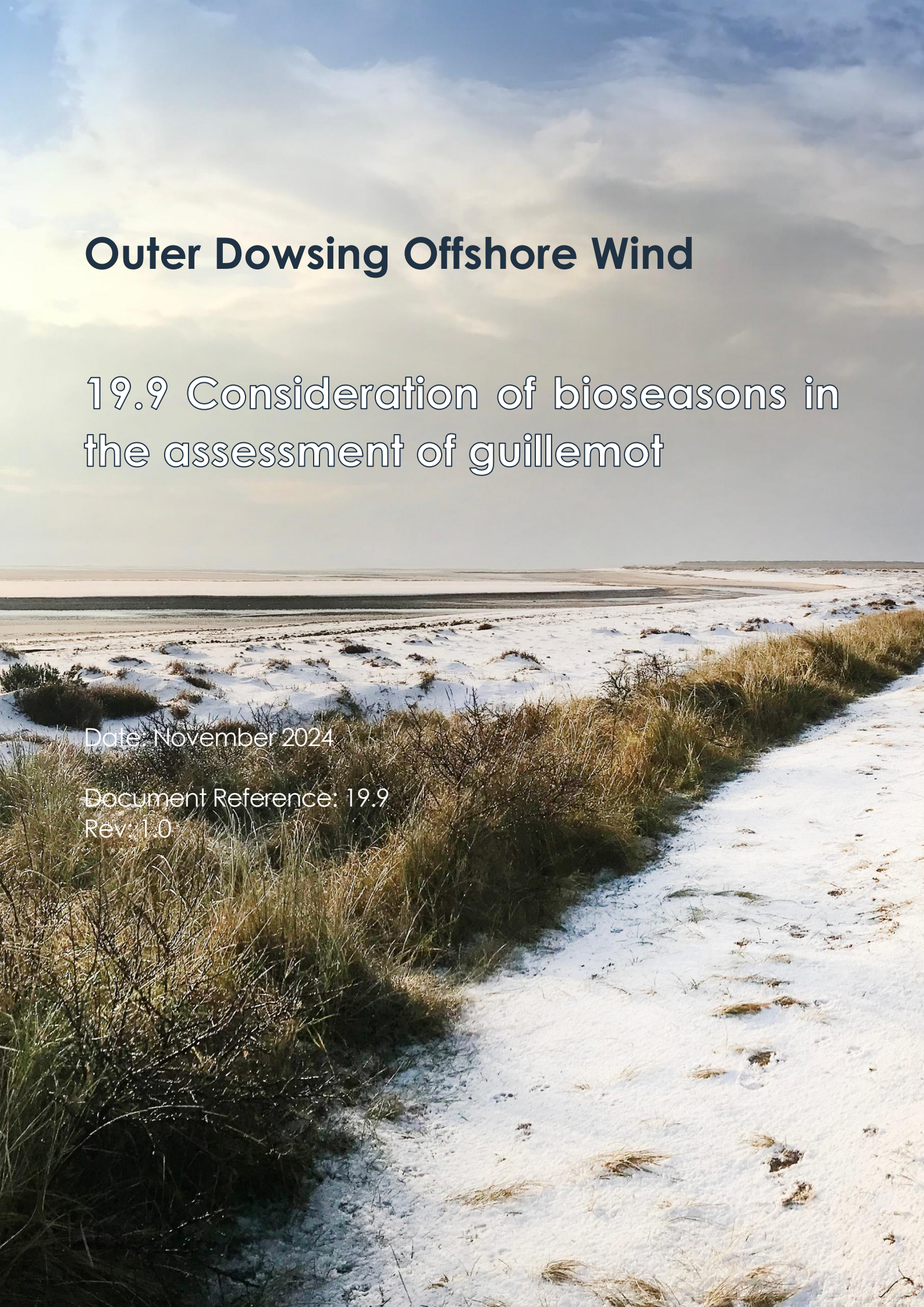

Outer Dowsing Offshore Wind

19.9 Consideration of bioseasons in the assessment of guillemot

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Acronyms & Definitions

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AEoI	Adverse Effect on Integrity
ANS	Artificial Nesting Structures
FFC SPA	Flamborough and Filey Coast Special Protection Area
MMFR	Mean Maximum Foraging Range
ODOW	Outer Dowsing Offshore Wind
ORBA	Offshore Restricted Build Area
ORCP	Offshore Reactive Compensation Platform
OWF	Offshore Wind Farm
RIAA	Report to Inform Appropriate Assessment
SD	Standard Deviation
SNCB	Statutory Nature Conservation Body

Terminology

Term	Definition
The Applicant	GT R4 Limited (a joint venture between Corio Generation (and its affiliates), TotalEnergies and Gulf Energy Development), trading as Outer Dowsing Offshore Wind
Apportioning	The process by which impacts from an offshore project are allocated to onshore colonies or other aggregations
Array Area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned.
Bioseason	A biologically defined period of a bird's annual cycle based on the location and/or behaviour of the birds
Cumulative Impact	Impacts that result from changes caused by other present or reasonably foreseeable actions together with the Project.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the sensitivity of the receptor, in accordance with defined significance criteria.
Export Cables	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via an Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Intertidal	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS)

Term	Definition
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
Offshore Reactive Compensation Platform (ORCP)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents) housing electrical reactors and switchgear for the purpose of the efficient transfer of power in the course of HVAC transmission by providing reactive compensation.
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Offshore Substation (OSS)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents), containing— (a) electrical equipment required to switch, transform, convert electricity generated at the wind turbine generators to a higher voltage and provide reactive power compensation; and (b) housing accommodation, storage, workshop auxiliary equipment, radar and facilities for operating, maintaining and controlling the substation or wind turbine generators
Offshore Restricted Build Area (ORBA)	The area within the array area, where no wind turbine generator, offshore transformer substation or offshore accommodation platform shall be erected
Outer Dowsing Offshore Wind (ODOW)	The Project
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.

Reference Documentation

Document Number	Title
Document Reference 19.8	Levels of precaution in the assessment and compensation calculations for offshore ornithology
Document Reference 19.10	Rates of Displacement in Guillemot and Razorbill
Document Reference 19.11	Lead-in periods for kittiwake breeding on Artificial Nesting Structures

1 Executive Summary

Following completion of the Report to Inform Appropriate Assessment for the Project (RIAA; AS1-095), with regard to guillemot, the RIAA has concluded that there is no potential for an Adverse Effect on Integrity (AEoI) alone or in-combination. However, given the advice received from Natural England that they may not be able to rule out the potential for AEoI for these species, a 'without prejudice' derogation case and compensation measures have been developed for this species.

Before any assessment occurs, birds are assigned bioseasons. Bioseasons are periods through a species' annual cycle that can be defined by a particular activity, such as breeding or migration. For some species such as razorbill, a full suite of bioseasons can be defined that encompasses breeding and non-breeding seasons, and two migration periods per 12-month cycle. However, for other species such as guillemot, it is not possible to define such specific bioseasons, only whether birds are in a breeding or a non-breeding season, in spite of the migrations that this species undertakes. This means that the use of bioseasons for guillemot adds an element of precaution to the assessment, potentially overstating the number of breeding birds within the models, i.e. as the guillemot breeding season (defined as March to July) encompasses a period when many guillemots are behaving as non-breeders, birds occurring on a given site in March and April, and therefore assumed to be breeding birds at the Flamborough and Filey Coast Special Protection Area (FFC SPA), could also include a proportion of individuals that are behaving as non-breeding birds or moving towards more distant breeding grounds.

This document outlines the Applicant's position in relation to the use of bioseasons when assessing impacts on guillemot (specifically in relation to Natural England's request for an additional post-breeding migration bioseason). The Applicant's position is presented within the context of the joint Statutory Nature Conservation Body (SNCB) (Joint SNCB Interim Displacement Advice Note, 2022) guidance on displacement.

The Applicant considers that the addition of a bespoke 'post-breeding' bioseason suggested by Natural England is over-precautionary as it assesses the same displacement impact on this population (of the adult birds at least) two times owing to the annual displacement being calculated by summing the impacts from each bioseason.

Post breeding dispersal is a movement of birds away from the colony with the potential consequence of a one-off diversion around the array, rather than any displacement. Therefore, the document also explains how adding a post-breeding bioseason disproportionately increases the calculation of annual displacement impact for guillemot due to the treatment of this one-off diversion around turbines as displacement. The Applicant considers that the application of either the Applicant's preferred displacement and mortality rates (50% and 1% respectively) or Natural England's preferred displacement and mortality rates (70% and 2% respectively) to this one-off diversion is disproportionately precautionary (Document Reference 19.10).

Rather than utilising a bespoke post-breeding bioseason, the Applicant retains its position, i.e. the use of the Furness (2015) recommended bioseasons.

2 Introduction

2.1 Project Background

1. GT R4 Limited (trading as Outer Dowsing Offshore Wind (ODOW)) hereafter referred to as the 'Applicant', is proposing to develop Outer Dowsing Offshore Wind (the Project). The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm) approximately 54km from the Lincolnshire coastline in the southern North Sea, export cables to landfall, Offshore Reactive Compensation Platforms (ORCPs), onshore cables, connection to the electricity transmission network, ancillary and associated development and areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation of a biogenic reef (see Volume 1, Chapter 3: Project Description (APP-058) for full details).

2.2 Document Purpose

2. This document outlines the Applicant's position and presents the case that the addition of a post-breeding bioseason (as recommended by Natural England) is over precautionary within the context of the joint Statutory Nature Conservation Body (SNCB) (Joint SNCB Interim Displacement Advice Note 2022) guidance on displacement. The document also discusses the nature of any potential impact during the post-breeding bioseason, and therefore how it should be assessed, within the context of birds from the Flamborough and Filey Coast Special Protected Area (FFC SPA).
3. The document provides a justification as to why the Applicant's approach of using the Furness (2015) recommended bioseasons is appropriate.
4. The document also presents an explanation of why the Applicant considers that bird behaviour during this post-breeding period should be considered as migration and therefore that any exclusion from the array area should be considered a one-off diversion rather than a displacement effect.
5. This report should be read in conjunction with the review of displacement levels for Auks (Document Reference 19.10) and the review of levels of precaution in the assessment and compensation calculations (Document Reference 19.8). The report on Lead-in periods for kittiwake breeding on ANS (Document Reference 19.11) is also relevant. The precautionary approach is a tool to enable decision makers to make a reasonable assessment of the associated risk, using the best scientific evidence available. The risk must be plausible and real and the precautionary principle should not be applied speculatively. Together these documents demonstrate the over-use of precaution across the assessment, apportioning and compensation calculation processes when applying Natural England's preferred approach.

3 The Bioseason Approach

6. Natural England have recommended that impacts on guillemot at the FFC SPA are assessed over three bioseasons. This is a recent modification of the previous position regarding bioseasons for guillemot, as stated in the Joint SNCB Interim Displacement Advice Note (2022) (noting that Natural England has not consistently requested this modification across all Offshore Wind Farm (OWF) projects), which recommends following Furness (2015) in defining two bioseasons for guillemot: a breeding season running from March to July and a non-breeding season running from August to February. Details of the Applicant's approach (and the Furness recommended position), and the new bioseasons for guillemot recommended by Natural England, are presented in Table 1 and within Chapter 12 Offshore and Intertidal Ornithology (AS1-040) and Chapter 12 Appendix 3 Displacement Assessment (APP-164).

Table 1. Applicant's position and new Natural England guidance for guillemot bioseasons.

	Pre-breeding migration	Breeding	Post-breeding migration	Non-breeding	Migration-free winter
Project approach (Furness)	-	Mar-Jul	-	Aug-Feb	-
Natural England recommendation	-	Mar-Jul	Aug-Sep	Oct-Feb	-

As the annual impact of a project is calculated by summing the bioseasonal impacts, the addition of the post-breeding bioseason covering the months of August and September substantially increases the Project's impact, increasing the (pre-apportioning) total number of birds impacted (using a 50% displacement rate and a 1% mortality rate) from 34.4 to 88.8 birds.

4 The Rationale for Bioseasons

7. Impacts from displacement are assessed over bioseasons. These are periods within a species' annual cycle which can be defined by a particular behaviour, or periods where birds in a given location may differ from those in the same place at a different time of year. SNCB guidance (Joint SNCB Interim Displacement Advice Note, 2022) recommends the use of a minimum of two bioseasons (breeding and non-breeding) depending on the species in question. However, where other periods can be robustly defined, such as migration periods, additional bioseasons can be used. This ensures that impacts are measured against the correct background population.
8. Impacts are defined using the mean peak occurrence in each bioseason (i.e. taking the mean of the monthly peaks over however many years of survey have been carried out). Impacts are then summed to quantify the annual impact. SNCBs recognise that this approach is precautionary as it may lead to double counting of impacts, as stated in the SNCB displacement advice note referenced above:

'Seasonal impacts should be summed across seasons. While acknowledged that this could result in birds being assessed in more than one season, and thus double counted, the precautionary approach is required in absence of empirical information on seasonal turnover on development sites.'

9. Natural England also recommends that 100% of the impacts from the Project should be apportioned to the FFC SPA during both the breeding and the post-breeding dispersal bioseasons, thereby adding further precaution. This level of apportioning suggests that Natural England anticipate no seasonal turnover (i.e. during both seasons all of the birds on the site will be from the FFC SPA). By following this approach, all birds could be assessed in both bioseasons, and as such all birds in the breeding season could be double counted.
10. A precautionary approach (i.e. accepting that there may be some double counting) is applied to address uncertainties regarding seasonal turnover. Apportioning 100% of impacts to FFC SPA in both seasons assumes no seasonal turnover which, in terms of assessing impacts solely to FFC SPA, is the most precautionary position possible. Therefore, apportioning all birds to FFC SPA, and summing impacts over bioseasons to address unknown amounts of turnover, applies two precautionary elements to the same issue.
11. The Applicant considers that Natural England's recommendation for an additional bioseason would result in an over-precautionary approach, particularly when considered against the layers of precaution incorporated into the assessment through the application of precautionary displacement and mortality rates, apportioning 100% of these impacts to FFC SPA, apportioning all birds present as adults, and not applying sabbatical rates.
12. The joint SNCB guidance states:

'However, for a number of species there may be evidence to support an additional breakdown of the non-breeding period to account for periods when distribution, activity or population mix are

distinctly different (for example post-breeding aggregations of some auk and sea duck species associated with flightless periods, migration periods etc.)'

13. Natural England have recommended that the Applicant treats the months of August and September as an additional bioseason for guillemot, covering post-breeding dispersal. For guillemot in August and September, the rationale for the consideration of this period as a different bioseason cannot be based on different populations mixing (as Natural England have recommended apportioning is 100% during both the breeding and post-breeding dispersal periods). The rationale cannot be based on differing distributions as there are no data beyond the array area on distributions of birds from the colony in August and September. Therefore, the rationale must be based on the activity being different (e.g. birds dispersing during the post-breeding period as opposed to birds foraging to provision young). However, the guillemot population using the array area cannot be considered an aggregation during a flightless period. There is no evidence that the numbers of birds form a discreet aggregation on the site (i.e. there are no concurrent data on whether densities are lower outside the survey area), and there is no evidence from any source that birds linger within the survey area any longer than they do elsewhere. As such, from the options provided within the SNCB advice note, the activity must logically be considered to be a migration, with the assumption that birds are simply passing through the site during the post-breeding season.
14. The effect on birds in the post-breeding season must therefore be a one-off diversion effect rather than displacement, as birds will be passing through the site as they disperse. With the effect occurring once per year, due to one transit being necessary during the dispersal period, the effect should not be considered in the same way as barrier effects. Barrier effects lead to increased energetic demand from repeated lengthened foraging flights as birds avoid an area that was previously available for transit. Whilst the SNCB guidance on barrier effects works well in describing the mechanism of effect, impacts from a one-off diversion effect will be at a totally different scale. The SNCB guidance states:

A barrier is a physical factor that limits the migration, or free movement of individuals or populations, thus requiring them to divert from their intended path in order to reach their original destination. This effect is expected to increase the energy expenditure of birds if they have to fly around the area in question in order to reach their goal. Birds experiencing barrier effects are typically in flight, but not necessarily always so.

15. In addition, the SNCB guidance states:

A key distinction between barrier and displacement is that birds experiencing barrier effects typically travel longer distances (i.e. to some point beyond the OWF) and did not intend to forage/utilise the OWF site itself, but some area beyond it.

4.1 Diversion Effects on Post-breeding Dispersal

16. With birds potentially experiencing a hindrance to passing through the site on a 'one off' transit to an area some way beyond the array area, this effect should not be considered as displacement and therefore should not be assessed using the same parameters as used for displacement assessment during the breeding season (as laid out in Joint SNCB Interim Displacement Advice Note, 2022) (see paragraph 18). One-off incidences of diversion from an intended path are very unlikely to have a discernible impact on an individual bird when compared with repeated displacement from a preferred feeding area during the breeding season. As such, the (already precautionary) use of the 50% displacement and 1% mortality levels for this bioseason is likely to considerably over-estimate impacts from one-off encounters with the Project. This position is supported by the SNCB advice note on displacement, which states:

'Barrier effects are more likely to result in individual/population level impacts, if they occur during the breeding season (and at colonies close to an OWF)'.

17. The SNCB guidance (Joint SNCB Interim Displacement Advice Note, 2022) also states:

'Individuals are less constrained during the non-breeding season (i.e. no longer central-placed foragers). Therefore, increases to overall flight costs due to barrier effects while on migration are likely to be very small (Topping and Petersen, 2011)'.

18. As the post breeding dispersal is considered a migration, SNCBs agree that increases to overall energetic costs are likely to be very small.
19. Energetic costs for guillemot may be even lower as, during August and September, guillemot are in active primary moult during which time they do not fly. According to Dunn *et al*., 2022, this post breeding moult period (August and September) coincides with an accumulation of fat reserves (which have been diminished during the breeding season) and therefore the birds are not under energetic strain. Relative energy expenditure is therefore low during this period and a one-off diversion is unlikely to have a measurable effect. As the energetic cost of swimming and diving is considerably lower than that of a guillemot in flight (Elliot *et al*., 2013), the effect of a one-off diversion on a swimming bird is considerably lower than the effect of a one-off diversion on a flying bird. With increases to energetic costs predicted to be very low, consequent mortality is very unlikely.

4.2 Apportioning During the Post-breeding Dispersal Season

20. Data from tracking studies, presented in Buckingham *et al.,* (2022), demonstrate that moulting guillemots from eastern Scottish colonies disperse into the North Sea. In particular, 50% density kernels (the area within which 50% of the tracked locations were recorded) for those birds from the East Caithness Cliffs SPA and the Buchan Ness to Collieston Coast SPA overlap with latitudes similar to that of the Project array area. The 50% density kernel for birds from Fair Isle reaches a similar latitude to the FFC SPA. These 50% kernel densities only represent the distribution of half of the birds, with the other half of the population more widely dispersed (and therefore not forming part of the 50% density kernel), and therefore it is highly likely that some birds from these colonies could be within the Project array area during the post breeding dispersal bioseason. The 50% density kernels are formed from data from August 16th to September 15th 2017 to 2019, and so the data informing the analysis overlap completely with the post breeding dispersal bioseason recommended by Natural England.
21. Data collected from 43 adult guillemot tracked from the Isle of May in 2005 and 2006, presented by Dunn *et al.*, (2020), demonstrate extensive use of the southern North Sea during the months of August and September. In both months, the Project array area is entirely within the 50% density kernel for these tracked birds. Therefore, it is highly likely that some adult birds dispersing from the Isle of May will interact with the Project array area during these months.
22. The 50% density kernels presented by Buckingham *et al.,* (2022) and Dunn *et al.,* (2020) demonstrate how far birds travel from their breeding colony, and how fast, during this period of flightless post-breeding dispersal. The Buckingham study focussed on nine guillemot colonies, five of which are located in the North Sea. The study demonstrates that the locations used are not exclusive to individual colonies, with some areas in the southern North Sea used by birds from all five different colonies. This means that an offshore area distant from the FFC SPA is unlikely to be exclusively populated by birds from FFC SPA during the post-breeding dispersal bioseason and that impacts during this season should be apportioned to a suite of colonies that includes FFC SPA, rather than exclusively to FFC SPA as advised in Relevant Representations from Natural England.
23. The distances travelled by large numbers of tracked birds during August and September suggest that, for birds from the FFC SPA, the relevant geographic range for the breeding season (as defined by mean max foraging range plus one standard deviation, which for guillemot is 73.2 km plus 80.5 km) is unlikely to be the same as the relevant geographic range for the post-breeding dispersal season as demonstrated in Dunn *et al*., 2020 and Buckingham *et al*., 2022. As such, the reference population against which impacts are measured should also consider the presence of birds from other colonies.
24. The data presented for adult guillemots dispersing from the Isle of May by Dunn *et al.,* (2020) show how guillemots from this colony utilise the majority of the southern North Sea. This indicates that either guillemot do not have restrictive habitat needs during this period, or can tolerate being in sub-optimal habitat, and therefore should be able to adapt to, or endure the need for, a one-off diversion during migration with little chance of mortality.

4.3 Cumulative Impacts on Guillemot from FFC SPA

25. Breeding season impacts on guillemot have been apportioned to FFC SPA from 12 projects in addition to ODOW, totalling a displacement of 45,040 birds from within a mean maximum foraging range of the colony plus one standard deviation (MMFR+1SD) of 153.7 km (73.2 MMFR recommended by + 1 SD of 80.5). With a colony count of 149,980, this represents approximately one third of all birds at the colony. Details of the levels of impact from each project apportioning impact to FFC SPA, using Natural England's preferred approach, are presented in Table 2.

Table 2. Impacts on FFC SPA from offshore projects using Natural England's preferred approach

Project	Impact apportioned to FFC SPA (number of birds)
Hornsea Project 1	4,554
Humber Gateway	99
Teesside	267
Westernmost Rough	347
Hornsea Project 2	3,581
Triton Knoll	425
Dogger Bank A	1,893
Dogger Bank B	3,318
Dogger Bank C	1,149
Sofia	1,824
Hornsea 4	9,382
Dogger Bank South (East and West)	14,927
Outer Dowsing	4,687
Outer Dowsing (with ORBA)	3,638
Total	**46,044**
Total (with ORBA)	**45,040**

26. The projects listed in Table 2 take up less than 10% (8.41%) of the 'at-sea area' described by the MMFR+1SD for guillemot from FFC SPA. Given that most of these projects are beyond the mean foraging range for guillemot (33.1 km) from FFC SPA, and many of the projects with the biggest impacts are beyond the mean foraging range plus 1 SD (33.1 + 36.5 km), it is unlikely that 33% of the birds foraging from this colony during the breeding season should occur in 8.41% of the waters available to them, when these waters are so far from the shore.

27. As all the birds subject to post-breeding dispersal are from the FFC SPA and would have been breeding birds during the preceding bioseason, it can be assumed that, for all projects listed, the apportioning of impacts during the post-breeding bioseason would align with the apportioning of impacts during the breeding season.
28. Identical proportions of juveniles would be present at each site (as proportion of juveniles will be driven by productivity at FFC SPA). As such, the proportions involved will be the same. Therefore, in total, 33% of all birds from the post-breeding bioseason will occur within 8.41% of the waters available to them. While this may be more likely in the post-breeding bioseason than the breeding season (due to birds being less spatially constrained), this proportion should still be considered unlikely. This suggests that numbers at the Project (and other projects with connectivity to FFC SPA) during a 'post breeding bioseason' are likely to be inflated by birds dispersing from other colonies. As such, the apportioning of 100% of birds on the project to FFC SPA should be considered highly precautionary and is likely to over-estimate the effect that displacement during the post-breeding dispersal period will have on the FFC SPA.

5 Summary

29. The Applicant considers that the addition of a bespoke 'post-breeding' bioseason suggested by Natural England is over-precautionary as it considers the same displacement impact on this population (of the adult birds at least) two times: once during the breeding season and once during post-breeding dispersal. The Applicant also considers that bird behaviour during this period should be considered as migration and that any exclusion from the array area should therefore be considered a one-off diversion effect rather than a displacement effect. The Applicant considers that the application of either the Applicant's preferred displacement and mortality rates (50% and 1% respectively) or Natural England's preferred displacement and mortality rates (70% and 2% respectively) to this one-off diversion is disproportionately precautionary (document reference 19.10).
30. The addition of a bespoke 'post-breeding' bioseason for guillemot increases projects impacts from 34.4 to 88.8 birds based on the (pre-apportioning) total number of birds effected and using a 50% displacement rate and a 1% mortality rate.
31. Rather than utilising a bespoke post-breeding bioseason, the Applicant retains its position, i.e. the use of the Furness (2015) bioseasons in line with SNCB guidance (Joint SNCB Interim Displacement Advice Note, 2022).

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