East Anglia ONE North Offshore Windfarm

Appendix 4

Information to Support Appropriate Assessment Report – Consultation Responses

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Table A2.3	Comments on the draft HRA related to marine mammals

Glossary of Acronyms

DCO	Development Consent Order
DDV	Drop Down Video
EA	East Anglia
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
ES	Environmental Statement
ETG	Expert Topic Group
HDD	Horizontal Direct Drilling
HRA	Habitats Regulations Assessment
IFCA	Inshore Fisheries Conservation Authority
MARESA	Marine Evidence Based Sensitivity Assessment
MESH	The Mapping European Seabed Habitat Project
MMO	Marine Management Organisation
MNNS	Marine Non-Native Species
NE	Natural England
NPS	National Policy Statement
PEIR	Preliminary Environmental Information Report
PEMP	Project Environmental Management Plan
SPA	Special Protection Area
SPM	Suspended Particulate Matter
SPR	ScottishPower Renewables
ZEA	Zonal Environmental Appraisal

Glossary of Terminology

Applicant	East Anglia ONE North Limited
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one offshore construction operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA and Appropriate Assessment.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, this will include fibre optic cables.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land and connect to the onshore cables.
Meteorological mast	An offshore structure which contains metrological instruments used for wind data acquisition.
Marking buoys	Buoys to delineate spatial features / restrictions within the offshore development area.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and transition bays located at landfall.
Offshore development area	The East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs).
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall. These cables will include fibre optic cables.
Offshore construction, operation and maintenance platform	A fixed structure required for construction operation and maintenance personnel and activities.
Offshore platform	A collective term for the offshore construction operation and maintenance platform and the offshore electrical platforms.
Platform link cable	An electrical cable which links one or more offshore platforms, this will include fibre optic cables.
Safety zones	A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water

2 Consultation Responses

2.1.1 Introduction

1. This appendix covers those statutory consultation responses relating to the draft Habitats Regulations Assessment (HRA) (SPR 2019a) submitted as part of Section 42 consultation. Relevant discussions points from Expert Topic Group (ETG) Meetings have also been incorporated as appropriate.

2. Separate tables for each receptor topic which provide the stakeholder comments and responses given by the Applicant are provided as follows:

   - Onshore Ornithology – ***Table A2.1***;
   - Offshore Ornithology – ***Table A2.2***; and
   - Marine Mammals – ***Table A2.3***.

3. As Section 42 consultation for the proposed East Anglia ONE North project was conducted in parallel with the proposed East Anglia TWO project, where appropriate, stakeholder comments which were specific to East Anglia TWO, but may be of relevance East Anglia ONE North, have also been included in the consultation responses for East Anglia ONE North.

2.1.2 Onshore Ornithology Draft HRA Section 42 Comments

Table A2.1 Consultation Responses on the Draft HRA Related to the Onshore Ornithology

Consultee	Date	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
RSPB	25/03/2019	Additional measures to limit the impact of disturbance on nightjar have been set out within the HRA (paragraph 216 EA2 and paragraph 216 EA1N), which primarily relate to a Breeding Bird Protection Plan (BBPP) and the presence of an Ecological Clerk of Works to ensure no activities take place that could cause disturbance to breeding birds. The principles of these may be appropriate, but will rely heavily on a suitable schedule of surveys to ensure accurate understanding of changes to breeding birds in the works area is known. The RSPB recommends that the BBPP update site managers on the works schedule to ensure any impacts on site management or surveys required to effectively manage the site to maintain conservation objectives are minimised. We support the final bullet point of the proposed mitigation, specifically, "…Where, in the opinion of the suitably qualified ecologist, disturbance cannot be avoided by mitigation, construction works within the area of disturbance will be suspended until chicks have fledged." The RSPB recommends that such decisions should be taken in conjunction with NE and with the relevant landowners and/or site managers to ensure a fully informed and agreed approach is taken.	Noted. Further breeding bird surveys, similar in scope to those 2018 surveys, have taken place within the onshore ornithology study from May to August 2019. As the target species present are found in distinct and predictable habitat types, the combination of two breeding seasons surveys, combined with historic data from 2009 to 2018 is considered to be sufficient to adequately determine typical distribution and abundance of these species. Further pre-construction surveys would take place to help avoid disturbance effects during the construction period, as part of the Breeding Bird Protection Plan (BBPP). Further details on the BBPP are provided within the Outline Landscape and Ecological Management Scheme (OLEMS) submitted with this DCO application and secured under the requirements of the draft DCO.
RSPB	25/03/2019	Paragraph 55 of the EA2 HRA document (p.14) concludes that "…there would be no significant adverse effect on the integrity of the SPA due to habitat loss" (emphasis added). The Habitats Regulations do not assign a significance to an AEOI conclusion; either there is an adverse effect or there isn't.	Noted. The relevant conclusions have been updated throughout this Information to Support Appropriate Assessment Report document to read "no adverse effect on the integrity of the SPA".

Consultee	Date	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
RSPB	25/03/2019	Paragraph 63 of the EA2 HRA document (p.16) concludes that "…an unmitigated significant effect on the integrity of the SPA due to construction disturbance to breeding nightjar cannot be ruled out" (emphasis added). There has already been screening completed which has identified that a Likely Significant Effect is possible and the current assessment should be avoiding an Adverse Effect on Integrity (AOEI) of the SPA. The wording for this section needs to be revised to ensure it accords with the Habitats Regulations.	Noted. The relevant conclusions have been updated throughout the ITSAAR document to read "no adverse effect on the integrity of the SPA".
RSPB	25/03/2019	Paragraph 52 (p.14) indicates that "0.483ha of the SPA designation, or 0.01% of the whole SPA (3,405ha)" would be affected by the proposed works. However, paragraph 74 (p.18) states that "a temporary loss of up to 0.966ha of the SPA designation, or 0.03% of the whole SPA (3,405ha)." It is unclear why these figures are different and should be clarified.	The extent of SPA loss due to the proposed East Anglia ONE North project alone would equate to 0.483ha, under the open-cut trenching scenario. When considered in-combination with the proposed East Anglia TWO project, this would equate to 0.966ha in total (i.e. 2 x 0.483ha) (detailed in ***section 3.3.2.5.1.1*** and ***section 3.3.3.5.1.1*** of this report).
RSPB	25/03/2019	Paragraph 63 of the EA2 HRA document, p.16 clearly highlights that mitigation measures are required. The initial set of mitigation measures that have been considered (noting that, reducing working corridor length and width should not be considered "embedded mitigation" due to recent case law) are insufficient to alter the conclusion. Additional measures to limit the impact of disturbance on nightjar have been set out within the HRA, which primarily relate to a Breeding Bird Protection Plan (BBPP) and the presence of an Ecological Clerk of Works to ensure no activities take place that could cause disturbance to breeding birds. The principles of these may be appropriate but will rely heavily on a suitable schedule of surveys to ensure accurate understanding of changes to breeding birds in the works area is known.	Further breeding bird surveys, similar in scope to those 2018 surveys, have taken place within the onshore ornithology study from May to August 2019. As the target species present are found in distinct and predictable habitat types, the combination of two breeding seasons surveys, combined with historic data from 2009 to 2018 is considered to be sufficient to adequately determine typical distribution and abundance of these species. Mitigation associated with minimising the likelihood of a significant effect of construction activities on the Sandlings SPA have been outlined in Information to Support Appropriate Assessment Report. If an open-cut methodology is used to cross the narrowest point of the SPA, the construction would last an estimated one month in duration. The Applicant has

Consultee	Date	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
			committed to conducting this estimated one month of open cut trenching through the SPA outside of the breeding bird season (mid-February to August inclusive), therefore minimising potential impacts to the features of this designated site. If an HDD technique were to be employed, construction would be approximately 12 months in duration and it would not be possible to impose a seasonal restriction on such works. Entry and exit pits would be located outside of the SPA.
RSPB	25/03/2019	The RSPB also recommends that the BBPP sets out a clear communication strategy for updating site managers on the works schedule to ensure any impacts on site management or surveys required to effectively manage the site to maintain conservation objectives are minimised. To have confidence in any BBPP we recommend that this be drafted for consideration at examination to ensure that appropriate principles are agreed, and the key measures needed to be in place prior to and during construction have been formally agreed.	The BBPP would be drafted and agreed with the relevant stakeholders post-consent. Details regarding the content of the BBPP are provided within the Outline Landscape and Ecological Management Strategy (OLEMS) submitted with this DCO application, secured under the requirements of the draft DCO.
Natural England	26/03/2019	Nightjar are also recorded on the Sandlings SPA in April (Sandlings SPA Conservation Objectives Supplementary Advice, 2019).	Noted, this is reflected in ***section 3.2.1.1*** of this Information to Support Appropriate Assessment Report.
Natural England	26/03/2019	Assessment of habitat loss to nightjar due to onshore cable infrastructure - Natural England welcomes that the project design has minimised the overlap of the onshore cable route with the Sandlings SPA, choosing a crossing at the narrowest point. Natural England reiterate their preference for HDD under the SPA, rather than open cut trenching through the site. There is currently insufficient detail provided on the worst case scenario i.e. open cut trenching if adopted and how habitats would be restored to provide good quality habitat for the	Approval noted regarding the onshore cable route crossing at the narrowest point of the SPA. Detailed information on the open-trenching and alternative HDD options for crossing the SPA/SSSI and within the landfall area is presented in ***Chapter 6 Project Description***, and summarised in this Information to Support Appropriate Assessment Report and ***Chapter 23 Onshore Ornithology*** for the purposes of the impact assessment.

Consultee	Date	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
		species. There is no consideration of timing of works in relation to the features of the site.	Where an open-cut methodology is used to cross the narrowest point of the SPA, the construction would last an estimated one month in duration. The Applicant has committed to conducting this estimated one month of open cut trenching through the SPA outside of the breeding bird season, therefore minimising potential impacts to the features of this designated site. If a HDD technique were to be employed, construction would be approximately 12 months in duration and it would not be possible to impose a seasonal restriction on such works.
Natural England	26/03/2019	Assessment of disturbance to nightjar due to onshore infrastructure – Natural England welcomes the reduction of the working corridor width within the SPA. There is currently insufficient information provided relating to noise, light or vibration disturbance effects on this species. The direct habitat loss associated with the in combination open cut trenching working corridor and the area of disturbance from light, noise and vibration, may reduce the foraging area available to Nightjar. The structure and function of the habitats of the qualifying feature may therefore be reduced as a result of the proposed development.	Approval noted regarding the reduced width of the onshore cable route crossing the SPA. Detailed information on the open-trenching and alternative HDD options for crossing the SPA/SSSI and within the landfall area is presented in ***Chapter 6 Project Description***. For the purposes of the assessment presented in this Information to Support Appropriate Assessment Report, the relevant parameters in relation to disturbance have been considered and are discussed in ***sections 3.2.1.4.1*** and ***section 3.2.2.4.1*** of this Information to Support Appropriate Assessment Report for nightjar and woodlark respectively.
Natural England	26/03/2019	Natural England welcomes that 'HDD techniques would be employed where practicable, where the indicative onshore development area overlaps with the Sandlings SPA. The HDD entry pits would (where possible) be located away from the SPA to avoid any potential impacts'.	Noted.
Natural England	26/03/2019	Assuming a worst case scenario of open cut trenching across the SPA, with EA2 and EA1N following sequentially i.e. with a disturbance period of up to 6 years during construction with additional time for habitats to be re-established; The structure	Detailed information on the open-trenching and alternative HDD options for crossing the SPA/SSSI and within the landfall area is presented in ***Chapter 6 Project Description***, and summarised in this Information to

Consultee	Date	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
		and function of the habitats of the qualifying feature may be reduced as a result of the proposed development, over a number of breeding cycles. Given that the developer has identified that there is no suitable habitat for Nightjar outside the SPA this will put increasing pressure on an already declining population. We advise that on the information currently available an adverse effect on integrity of the SPA cannot currently be ruled out. Further information needs to provided regarding the final design and timing of proposed works in relation to the SPA features.	Support Appropriate Assessment Report and ***Chapter 23 Onshore Ornithology*** for the purposes of the impact assessment. Based on the RSPB historic data from 2009 to 2018, and survey data in 2018 and 2019, no nightjars have been recorded where open-cut trenching is used to cross the narrowest point of the SPA. The construction here would last an estimated one month in duration. The Applicant has committed to conducting this estimated one month of open cut trenching through the SPA outside of the breeding bird season, therefore minimising potential impacts to the features of this designated site. If a HDD technique were to be employed, construction would be approximately 12 months in duration and it would not be possible to impose a seasonal restriction on such works. In terms of construction scenario 2, both projects would be subject to the seasonal restriction for the open-cut trenching used to cross the SPA. Therefore, this assessment concludes that there will be no adverse effect on the integrity of the SPA.
Natural England	26/03/2019	Woodlark are recorded on the site February to August. The HRA does not consider the timing of construction in relation to sensitive periods for features (Sandlings SPA Conservation Objectives Supplementary Advice, 2019).	Noted. This has been added into ***section 3.2.1*** of this Information to Support Appropriate Assessment Report. Where an open-cut methodology is used to cross the narrowest point of the SPA, the construction would last an estimated one month in duration. The Applicant has committed to conducting this estimated one month of open cut trenching through the SPA outside of the breeding bird season (mid-February to September), therefore minimising potential impacts to the features of this designated site. If a HDD technique were to be employed, construction would be approximately 12

Consultee	Date	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
			months in duration and it would not be possible to impose a seasonal restriction on such works. The seasonality of works has been considered throughout ***section 3*** of this Information to Support Appropriate Assessment Report.
Natural England	26/03/2019	Woodlark were recorded inside the SPA, on the SPA boundary and outside the SPA within the red line boundary. Assuming a worst case scenario of open cut trenching across the SPA, with EA2 and EA1N following sequentially i.e. with a disturbance period of up to 6 years during construction with additional time for habitats to be re-established. The structure and function of the habitats of the qualifying feature may therefore be reduced as a result of the proposed development, over a number of breeding cycles. We advise that on the information currently available an adverse effect on integrity of the SPA cannot currently be ruled out. Further information needs to provided regarding the final design and timing of proposed works in relation to the SPA features. As identified in our 2017 scoping response (231180) Timing of construction works could be a mitigation option.	The onshore development area has been refined to take into consideration the distribution of designated features of the SPA. Based on the RSPB historic data from 2009 to 2018, and survey data in 2018 and 2019, no woodlarks have been recorded where open-cut trenching is used to cross the narrowest point of the SPA. The construction here would last an estimated one month in duration. The Applicant has committed to conducting this estimated one month of open cut trenching through the SPA outside of the breeding bird season (mid-February to September), therefore minimising potential impacts to the features of this designated site. If a HDD technique were to be employed, construction would be approximately 12 months in duration and it would not be possible to impose a seasonal restriction on such works. In terms of construction scenario 2, both projects would be subject to the seasonal restriction for the open-cut trenching used to cross the SPA. Therefore, this assessment concludes that there will be no adverse effect on the integrity of the SPA.

2.1.3 Offshore Ornithology Draft HRA Section 42 Comments

Table A2.2 Consultation Responses on the Draft HRA Related to the Offshore Ornithology

Consultee	Date / Document	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
RSPB	25/03/2019 Comments on the Draft HRA	Habitats Regulation Assessment (HRA). Due to the methodological issues highlighted, the RSPB considers the HRA conclusions are not based on appropriate assumptions. Conclusions are not based on the worst-case scenario and seek to base assumptions on lower mortality figures than can be justified.	The ITSAAR has been updated taking into account comments received where these are considered to be appropriate for inclusion and with additional evidence and justification for aspects where the existing assessment is considered robust.
RSPB	25/03/2019 Comments on the Draft HRA	We note that (paragraph 65, p.26), except for lesser black-backed gull, the migration-free breeding season has been used rather than the standard breeding season, as it is assumed that there is a very low presence of breeding birds within the project area. The RSPB agrees with this approach. However, paragraph 244 (p.59) of the Habitats Regulations Assessment refers to the lesser black-backed gull migration-free breeding season (May-July) for Alde-Ore Estuary SPA. The RSPB requests clarity on the approach that will be adopted, reiterating that we support the approach set out in Chapter 12 using the full breeding season for lesser black-backed gull and not the approach set out in the HRA.	The lesser black-backed gull assessment has been updated with the addition of consideration of impacts assessed using the full breeding season.
RSPB	25/03/2019 Comments on the Draft HRA	4.4.1.3 Assessment of collision risk to lesser black-backed gull (p.58) Paragraph 244 (p.59) (paragraph 243 EA1N) refers to the lesser black-backed gull migration-free breeding season (May-July) for the Alde-Ore Estuary SPA. In Chapter 12, paragraph 65 (p.) there is a commitment to use the full breeding season (which includes the overlap months) to estimate collision risk. The RSPB requests clarity on this inconsistency and assurance that the migration-free breeding season will be used to predict mortality for lesser black-backed gulls.	As above.

Consultee	Date / Document	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
RSPB	25/03/2019 Comments on the Draft HRA	The mean max foraging range is 141km for lesser black-backed gulls. The HRA (paragraph 247, p.60) sets out a reduced foraging range of 72km for considering in-combination impacts of wind farms that could be increasing mortality for this species. This results in the potential mortality reducing from 84 to 44.1 birds. No detailed information is provided to justify the reduction other than "…given the evidence from tracking studies (Thaxter et al. 2012b, 2015), it is questionable how realistic it is to include all of the windfarms within 141km." The RSPB disagrees with this approach and considers it to considerably underestimate the potential impact from the project. This is not standard practice and the text and calculations should be revised.	Further consideration of foraging ranges and how these relate to potential impacts has been included in the assessment. See ***section 4.4.1.2***.
RSPB	25/03/2019 Comments on the Draft HRA	Criticisms of kittiwake tracking data Paragraphs 289 to 302 (pp.75-78) of the HRA raise a number of issues with regard to the suitability of tracking data obtained as part of the FAME and STAR projects for use in the assessment. However, the Applicant's Information for the Habitats Regulations Assessment contains a number of misinterpretations and erroneous assertions. In paragraph 289 (p.75) it is claimed that the longest foraging trips from FAME/STAR kittiwake data were largely from colonies where the breeding success was zero or close to zero. This is stated without reference and is incorrect. The longest trips were recorded from Flamborough and Filey, where breeding success was comparatively high over the time of tracking. It is true, as stated in paragraph 289, that study birds tend to be reachable. This could be from the top of a cliff, or the bottom. This, however, does not necessarily mean that the birds are at the periphery of the colony. In some colonies all birds are reachable, especially with the long pole used at Flamborough and Filey. The periphery problem is true for Bempton due to accessibility issues at the high cliff sections and there have been studies showing lower	The Applicant acknowledges the detailed review that the RSPB has provided of the points of concern raised in the draft HRA. While we are in agreement over some of these issues, areas of uncertainty remain about the potential for tag effects on tagged individuals and the risk of bias due to unavoidable logistical aspects (e.g. catchability of birds within precipitous colonies). The Applicant also acknowledges that the RSPB has gone to considerable efforts to minimise such effects, however (as the RSPB note) the risk of bias and tag effects remains and it is considered appropriate that studies which discuss these are presented alongside the results from the RSPB studies.

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		breeding success at the edge of colonies, which is why we are currently trying to tag birds at the centre of the colony. However, an examination of breeding success in 2017 found that it was generally low and breeding success at the tagging site in Flamborough is similar to the average for the whole SPA (Wischnewski et al., 2018). The claim in paragraph 289 that tagged birds were more likely to have failed is also incorrect. For the FAME and STAR data, where remote download tags were used, birds were re-caught on the nest so it is impossible to re-catch tagged birds if they have failed breeding as they would not return to their nest, or sit tight on the nest, if they were not protecting chicks. Furthermore, the fact that recaptured birds must still be breeding means the tagging study could actually be selecting more successful birds. In addition, there are no studies that we are aware of which demonstrate the effect of colony position on the foraging behaviour of seabirds, since the uncatchable birds cannot be tested. We agree that it is plausible that there is an effect, but whether the effect is larger than other factors determining where these birds are feeding (food availability, competition from conspecifics, seabird type etc.) is doubtful. In response to paragraph 294 (p.76), it should be noted that the FAME and STAR data are viewable on seabirdtracking.org. It can also be requested from the RSPB. Data have also been freely provided to a number of developers and their consultants. With reference to paragraph 290 (p.75), it is true that logger effects deserve the utmost attention. This is why the RSPB conducted trials in the first year of tagging kittiwakes using this technique and found no effect on foraging trip duration or breeding success. The reference to adverse effects from devices weighing more than 3% of a bird's body weight (Phillips et al, 2003) was for procellarids (petrels, prions and shearwaters) using long term deployments. In the study by Chivers et al. (2016), birds cited as having a 30% reduction in flight	

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		activity were actually equipped with two devices at once - a GPS tag of the same type used in FAME/STAR, plus an additional accelerometer. The paper does not give the weights of the devices separately but the tags are significantly larger than those used in FAME and STAR so a comparison is not necessarily valid. Furthermore, while it is true that Chivers et al. (2016) found that there was a reduction in flight behaviour in tagged kittiwakes carrying very heavy tags of more than five grams compared to birds carrying tags of only a gram, they also found that there was no difference in trip duration and the number of trips in 24 hours, and suggested that birds with heavier tags actually travelled shorter distances rather than longer ones (which also seems a bit more intuitive). Thus, tag effects do not really explain the longer ranging trips in tagged kittiwakes. Despite the need for the scientific community to better understand and minimise device effects, tagging represents the best way to determine foraging locations of birds from a specific colony. The tagging conducted in 2017 from Flamborough and Filey Coast SPA using tags that were less than 2.5 % of the birds' body weight observed even longer foraging ranges with multiple actively breeding birds visiting the East Anglia zone (Wischnewski et al., 2018). The study by Heggøy et al. (2015) (also referred to in paragraph 290) showing increased stress hormone in kittiwakes carrying loggers is potentially not comparable with RSPB tracking as it used tail attachments that have potential to increase flight costs by shifting the centre of gravity. With reference to paragraph 291 (p.75), Kidawa et al. (2012) found a reduction in body mass of chicks from birds that had been tagged and also recorded longer lasting trips but not longer distance ones. Also, they tagged little auks, which are a diving seabird species similar to penguins and for which some studies indicated that dorsal tag attachment increased drag and reduced their diving efficiency, thus	

Consultee	Date / Document	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
		increasing potential tag effects (ie. Ballard et al. 2001, Hamel et al. 2004). It is also important to note that foraging trip duration is not the same as trip range. Birds going on longer lasting trips are not necessarily travelling to more distant sites; it is only known that they are away from the colony for longer. Therefore trip duration does not give any insight into the birds' distribution. The quoted study by Passos et al. (2010) looked at the effect of additional weight on Cory's shearwater trip characteristics using geolocators. However shearwaters are, from a flight energetics perspective, very different from kittiwakes. They use dynamic soaring a lot which helps them to cover large distances without expending much energy, similar to albatrosses (Arnould et al. 1996), causing them to have regular foraging ranges that are more than four times larger (in this case) than foraging ranges of kittiwakes. Furthermore, geolocators can have errors of around 200 km therefore the conclusion drawn from this that attaching loggers increases the duration of foraging trips may not be applicable to kittiwakes in this case. Ponchon et al. (2015) did show prospecting movements in birds that fail early during the breeding season (during incubation). However, paragraph 292 (p.76) again incorrectly implies that FAME/STAR birds were unsuccessful breeders. Furthermore none of the tracks collected from birds that failed in the 2017 chick rearing period within the SPA include visits to other colonies. They exclusively show offshore trips to similar foraging areas to the ones visited by actively breeding birds. The statement that "in winter" kittiwake distribution is pelagic in paragraph 296 (p.77) is not specific enough. The time that some, not all, birds discussed in Bogdanova et al. (2017) are in the mid-Atlantic is not the whole non-breeding period. Furthermore, Bogdanova et al.	

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		(2017) found that successful breeders tended to stay closer to the colony, therefore the windfarm could be in contact with the most successful breeders, meaning that any collision mortality could have a greater impact on the population since it is affecting 'core' breeders. The Applicant cites Carroll et al., (2017) as evidence of limited connectivity between Flamborough and Filey Coast SPA and EA2/EA1N. Carroll et al., (2017) used data from the tracking of kittiwake from the Flamborough and Filey Coast SPA from 2010 to 2015. Subsequent tracking was carried out in 2017 and 2018. The tags used between 2010 and 2015 were GPS tags that required recapturing of the birds and typically were only able to collect data for a period of a few days, around the time of late incubation and early hatching when the birds are likely to remain closest to the nest. The tags used in 2017-2018 were very lightweight tags that allowed for remote downloading of data so there was no need to recapture the birds. A different attachment method was also used which meant that the tags remained on for longer, between 20 and 29 days. This means that kittiwakes were tracked for a longer part of the breeding season including when adults were provisioning large chicks (that can be left for longer than small chicks). The tracking data for 2017 are presented in Wischnewski et al. (2018) and have been made available to the Applicant. The foraging ranges recorded during 2017 were greater than those previous recorded, with a maximum foraging range of 324km, and this is most likely to be a function of the longer tracking period. Furthermore the tracking in 2017 showed a high degree of overlap with East Anglia zone. These more recent data should be used in assessment of connectivity. Data from 2018 are currently being analysed. In summary, we do not consider that the Applicant has presented information which justifies the exclusion of the FAME/STAR (or subsequent) tracking data from that used to inform consideration of kittiwake foraging range and connectivity with the East Anglia zone	

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		sites. Therefore, our recommendation that apportioning is revisited using these data still applies.	
RSPB	25/03/2019 Comments on the Draft HRA	For collision risk modelling of breeding season kittiwake, a biologically defined minimum population size (BDMPS) for 'breeding season populations of nonbreeding individuals' is calculated based on the percentage of the spring BDMPS which are subadults. This equates to 47.3% of the spring BDMPS for kittiwake. We do not agree, as stated above, that there is sufficient evidence that all birds present in the breeding season are likely to be non-breeders. We also would not agree that these assumptions could be used to avoid apportioning any impacts to the SPAs in the HRA.	Additional consideration of the age distribution of birds present in the southern North Sea in the summer has been provided in the assessment.
Natural England	26/03/2019 Section 42 Comments	Apportioning of impacts in the non-breeding seasons to relevant SPA colonies - For the apportionment of impacts of species to relevant SPA colonies during the non-breeding seasons, we would recommend that the data presented in the tables in Appendix A of Furness (2015) for the relevant species Biologically Defined Minimum Population Scales (BDMPSs) for each season (e.g. migration, winter etc.) are used.	The relevant sections have been updated as suggested.
RSPB	25/03/2019 Comments on the Draft HRA	Paragraph 313 of the EA2 HRA (p.82) gives a summary of the PVA outputs only. The RSPB recommends that these outputs be presented in the form of counterfactuals of population size. These are a robust and informative metric which indicate the percentage difference between the population with or without additional mortality at the end of the lifetime of the wind farm.	Where PVA results are available, counterfactuals have been presented in the assessment, however not all PVA reports include these metrics. In such cases consideration of other metrics has been provided, along with other relevant aspects, such as changes in the population size (e.g. gannet) since the modelling was conducted which also inform the assessment.

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RSPB	25/03/2019 Comments on the Draft HRA	Paragraph 314 (p.83) states that "Although Natural England no longer advocate the use of PBR for windfarm assessments, the results remain informative in terms of the relative predicted effects." In light of the publication of the RSPB Practitioner's Perspective (Green et al., 2016) and the reviews by Cook and Robinson (2015) and O'Brien et al. (2017) as well as NE's position and advice, PBR outcomes should not be included when considering potential impacts and whether it is possible ascertain that there will not be adverse effects on the integrity of SPAs designated to protect rare, threatened and regulatory migratory species in order to maintain or where necessary restore, these populations of conservation importance. Especially since determinations on levels of acceptable mortality derived from PBR will be higher than those acceptable for a population to continue to meet the conservation objectives of a SPA.	References to PBR in the assessment have been removed.
Natural England	26/03/2019 Comments on the Draft HRA	RTD mortality/displacement levels (EIA & HRA) -Natural England does not consider the 60-80% displacement and 1-5% mortality rate used by the SPR to be appropriate for assessing disturbance and displacement impacts to RTD from offshore wind farms. We note that this does not follow SNCB guidance (SNCBs 2017). Natural England notes the evidence presented by SPR on RTD displacement distances and displacement rates in the PEIR Chapter. However, we note that there are other studies that have been undertaken that have not been considered by SPR.	The Applicant has provided assessment using the Natural England advised displacement and mortality rates and also those derived from reviews of evidence conducted for other windfarm assessments.
Natural England	26/03/2019 Comments on the Draft HRA	Apportioning of impacts in the non-breeding seasons to relevant SPA colonies - For the apportionment of impacts of species to relevant SPA colonies during the non-breeding seasons, we would recommend that the data presented in the tables in Appendix A of Furness (2015) for the relevant species Biologically Defined Minimum Population Scales (BDMPSs) for each season (e.g. migration, winter etc.) are used. The apportionment of LBBGs to the Alde-Ore Estuary SPA and of kittiwakes to the FFC SPA in the non-breeding seasons	The assessments have been updated as advised.

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		has been undertaken using the relevant BDMPS sizes in Furness (2015). However, the figures from the tables in Appendix A of Furness (2015) do not appear to have been used in the non-breeding season apportionment of gannets to the FFC SPA. Whether the colony figure in the BDMPS tables used is the adult figure or that for all ages depends on any Population Viability Analysis (PVA) model and outputs to be used. For example, SPR has referred to the outputs of existing PVAs done for gannet and kittiwake at FFC SPA at Hornsea 2. The mortality currency of these models is adults, so for example, calculating the proportion that the Flamborough kittiwake number of adults in the relevant seasonal BDMPS represents of the overall total number of kittiwakes of all ages in the relevant season would be acceptable, dependent on the site data used being for birds of all ages. SPR has done this for kittiwake, but our understanding is that the gannet apportionment has used a colony figure of birds of all ages (as has also been done for LBBG at the Alde-Ore). Given that the outputs of the existing PVAs tend to be on an adult currency, we also advise that calculations of baseline mortality used in the HRA are undertaken on an adult currency, therefore using the adult colony figure and the adult mortality rate rather than on all ages.	
Natural England	26/03/2019 Comments on the Draft HRA	Apportioning of impacts in the breeding season for LBBG at the Alde-Ore Estuary SPA - Natural England is currently uncertain regarding the evidence base for 25 % apportionment of impacts to LBBG during the breeding season used by SPR. This is due to a number of reasons/areas of uncertainty: - The figure of 25 % used by SPR for the breeding season is based on simply summing the totals of counts from LBBG colonies within foraging range of EA2 (141km mean-maximum range in Thaxter et al. 2012). We note that this approach does not take account of the distance each colony is from EA2 or segregation, which apportioning	The estimated apportioning rate for lesser black-backed gull has been updated following additional reviews of evidence on gull populations in Norfolk and Suffolk including consideration of the advice provided by Natural England and the submissions for the Norfolk Vanguard project. See ***section 4.4.1.1***.

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		approaches should do. If the Alde-Ore is the closest of all the colonies within foraging range, then the apportionment approach may lack precaution (as it may be that birds present are biased more towards the Alde-Ore), but if it is the colony located furthest away then the approach may be precautionary. - There may also be some colonies within foraging range that have not been included in SPR's summed figure, which should be considered. - Given the potential for roof nesting urban colonies to be controlled, we are uncertain about SPR's approach to doubling the summed urban colonies figure based on the age of data and SPR's consideration that these colonies would have significantly increased in the interim. We would therefore suggest that SPR provides evidence to justify this decision.	
Natural England	26/03/2019 Comments on the Draft HRA	We advise SPR considers the advice provided during the Norfolk Vanguard examination, namely to consider our concerns and revisit its approach to apportioning of LBBG to the Alde-Ore Estuary SPA during the breeding season, including reviewing the merits of previous approaches undertaken for apportionment to account for the contribution of SPA colonies to the numbers of birds seen at marine renewable development sites during the breeding season, including: - That undertaken by Natural England during the Galloper offshore wind farm examination (Natural England 2012); and, - SNH interim guidance on apportioning impacts from marine renewable developments to breeding seabird populations in SPAs, updated November 2018, available from: here	The lesser black-backed gull assessment has been updated taking into consideration the advice provided by Natural England and the submissions for the Norfolk Vanguard project. See ***section 4.4.1.1***.

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Natural England	26/03/2019 Comments on the Draft HRA	Apportioning of impacts in the breeding season for kittiwake at the FFC SPA – SPR has apportioned 16.8 % of kittiwake collisions in the breeding season to the FFC SPA and this is considered by SPR to be a precautionary estimate. The tracking data for kittiwakes at the FFC SPA up until 2015 suggests low connectivity of the EA2 site with foraging birds from the colony. This together with the evidence presented by SPR for distributions of immature kittiwakes during the breeding season, and in the absence of specific data on the distributions of immatures who will later recruit into a breeding colony to quantify the proportion of pre-breeders present at a site suggests that the logic presented by SPR for arriving at this apportionment figure is reasonable. However, further tagging of kittiwakes from the FFC SPA colony has been undertaken in 2017 and the results of this does indicate that birds from the FFC SPA do forage within the former East Anglia Zone. Therefore, we recommend that SPR requests this data/reports from the RSPB and considers this in the final submission documents.	The kittiwake assessment has been reviewed and updated taking into account the advice received and further reviews of the available evidence.
Natural England	26/03/2019 Comments on the Draft HRA	We continue to advise that assessments of operational disturbance and displacement for RTD for offshore wind farm assessments are based on a constant displacement rate across the offshore wind farm site and a 4km buffer and suggest that a range of displacement rates up to 100 % and a mortality rate of up to 10 % are considered. However, we note that the matrix tables presented by SPR in the PEIR chapter cover the full ranges of up to 100 % displacement and 100 % mortality, so the figures for the Natural England preferred worst case scenario of 100 % displacement and 10 % mortality can be assessed.	The red-throated diver assessment has been reviewed and updated in line with advice received and further reviews of available evidence. The assessment concludes that no adverse effect on the integrity of the SPA as a result of the project-alone or in-combination effects is predicted. See ***section 4.2.1.6***.

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Natural England	26/03/2019 Comments on the Draft HRA	We note that the EA2 array boundary is immediately adjacent to Outer Thames Estuary SPA and there is potential that displacement effects could occur several kilometres into the SPA from both construction and operational phases, in addition to displacement and disturbance effects from cable laying. We advise that SPR consider revising their array boundary in order to avoid displacement effects on the SPA. Natural England has already advised in the context of several other Habitats Regulations Assessments that it is not possible to rule out an adverse effect on integrity in combination with other plans and projects for Outer Thames Estuary SPA. For example, advice to DECC regarding review of consent of London Array phase 1 (May 2013) ii) advice to MMO regarding marine aggregates licensing (February 2014), iii) advice to MMO regarding commercial fishing (July 2016).	As agreed with NE at ETG 4 on 20 June 2019, for the proposed East Anglia ONE North project, an assessment of displacement and disturbance effects during construction and operation has been undertaken (see ***section 4.3.1.5*** of the Information to Inform AA Report). The boundary of East Anglia TWO has been reduced and is no longer adjacent to the Outer Thames Estuary SPA (now 8.3km away). The assessment has been updated to take into account both the comments received and the updated site layout in that no assessment has been carried out given that there is very little potential for construction and operational displacement as was discussed and agreed with NE at ETG 4 on 20 June 2019.
Natural England	26/03/2019 Comments on the Draft HRA	We also consider that the Natural England worst case scenario of 100 % displacement and 10 % mortality should be used in the assessment of construction disturbance and displacement for RTD for both EIA and for the HRA assessment for RTD at the Outer Thames Estuary SPA. However, we note that consideration of this would not alter the conclusions made by SPR in Section 12.6.1.1.1 of the EA2 PEIR Chapter on assessment of offshore cable laying.	The assessment has been updated in line with advice received and additional reviews of evidence.
Natural England	26/03/2019 Comments on the Draft HRA	SPR has made reference to PBR outputs for the in-combination assessment for gannets and kittiwake from the FFC SPA. As noted at East Anglia 3 and at Norfolk Vanguard, Natural England does not advocate the use of PBR modelling when PVA modelling is available. Our advice to regulators is that no weight should be placed on PBR outputs when making decisions. Therefore, our consideration will focus only on the PVA outputs. Although Natural England has	References to PBR have been removed from the assessment.

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		previously considered PBR outputs for assessing population impacts in cases where up to date PVA models have not been available at an appropriate population scale. However, the use of PBR on its own, as the means of assessing population impacts on seabird populations presents a number of issues. Therefore, Natural England advises that wherever possible the population level impacts of predicted mortality from developments should be assessed using PVA models as these allow the effects of factors such as density dependence, population trends and varying demographic parameters to be explicitly investigated in terms of their effect on the population trajectory. PVA models also allow relative comparisons of population level effects with and without the additional mortality to be considered in a way that is not possible with PBR.	
Natural England	26/03/2019 Comments on the Draft HRA	SPR has also considered the significance of the predicted cumulative and in-combination collision impacts by reference to a various PVA models that are currently in existence: - For EIA in the Environmental Statement Chapter: the national gannet PVA undertaken by the SOSS-04 work (WWT 2012); kittiwake and great black-backed gull the EIA PVAs undertaken for the East Anglia 3 assessment (EATL 2015 & 2016). - For HRA: the PVA undertaken for Galloper offshore wind farm for LBBG at the Alde-Ore Estuary SPA (GWFL 2012); the PVAs undertaken at Hornsea 2 for kittiwake and gannet at the FFC SPA (MacArthur Green 2015b).	Noted
Natural England	26/03/2019 Comments on the Draft HRA	As has been raised during the Norfolk Vanguard and Hornsea 3 examinations, Natural England does not consider that the PVA models produced for East Anglia 3, Hornsea 2 and Galloper are adequate to inform the assessments for these projects and the same will apply for EA2. This is due to the following reasons:	The most up to date and appropriate PVA have been used to inform the assessment. While some of these were produced in line with the statutory guidance available at the time of production (which has been updated since), the results are considered to remain relevant. Furthermore,

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		- The stochastic simulations for the East Anglia 3, Hornsea 2, Galloper models and the SOSS gannet model were not run as matched pairs. Where stochastic PVA models are used, it is important to use a 'matched-runs' approach where a metric is derived for each matched pair of baseline and impacted simulations. Stochasticity is included in the population models, but the survival and productivity rates used for a 'pair' of impacted and un-impacted populations at each time step are the same. This means that the effect that is measured with the metric can be more clearly attributed to the impact, than to model uncertainties such as the variability in the demographic parameters that have been sampled or to observation errors. Cook & Robinson (2017) tested the effect of using unmatched compared to matched runs in PVA models and demonstrated that the median values of several evaluation metrics (e.g. counterfactual of population size) were greater when a matched runs approach was used compared to when the simulations were unmatched and the uncertainty around the metrics was much greater in the unmatched scenario. Models were run with 1,000 iterations. It may be the case that the median values of the matched versus unmatched runs approach will converge if a larger number of simulations (e.g. 5,000) are used, however the confidence limits are still expected to vary between the two approaches. Natural England therefore advises that one amendment required to the existing PVA models used by SPR is to run the simulations using matched-pairs. - Natural England recommends using the counterfactual of population growth rate and the counterfactual of population size to quantify the relative changes in a population in response to anthropogenic impacts. Whilst the EIA models for kittiwake and GBBG present the counterfactual of population size they do not present the output for counterfactual of growth rate. The other models utilised do not present outputs for the required metrics. The change in median growth rate metric that SPR has used in the kittiwake and gannet	additional context with respect to the magnitude of predicted impacts from East Anglia TWO (which are typically very small) is relevant and consideration of these aspects has been included in the assessment as appropriate.

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		FFC SPA in-combination CRM assessments are not the same as the counterfactual of growth rate that Natural England advises, as it has not been calculated as the growth rate at the end of the duration of the projection and SPR has calculated the median growth rate across all years simulated in the model. Clarification is required from SPR regarding the lifespan of the EA2 project, as the existing PVAs utilised by SPR have been run over 25 years. We note that more recent projects (e.g. Hornsea Project 3, Norfolk Vanguard and Norfolk Boreas) have lifespans of greater than this (35 years for Hornsea 3 and 30 years for Norfolk Vanguard and Boreas). If the EA2 project is to have a lifespan of greater than 25 years then the counterfactuals of population size and growth rate should be calculated at the end of the impact period (i.e. the lifespan of the EA2 project). If the lifespan of EA2 is to be greater than 25 years then SPR's approach whereby PVA models are run over 25 years would lead to an underestimate of impact, as potential impacts occurring in the last years of operation not covered by 25 years will not be accounted for in the models. - A further issue with deriving the metrics from the existing PVAs is that SPR has had to select impact levels from those published for Hornsea 2, Galloper etc., which means that SPR can only derive metric values from a pre-populated set of impact levels and cannot calculate a metric that is specific to the impact level that they have calculated for EA2. We also note that that further PVA models have been run for gannet, kittiwake and guillemot at the FFC SPA as part of the Hornsea 3 Examination (see: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-001142-DI_HOW03_Appendix%209.pdf). These models have attempted to address the concerns raised by Natural England regarding the previous FFC SPA PVA models used by both the Hornsea 3 and Norfolk Vanguard Applicants, as they have been run using a matched	

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		pairs approach, have been run over 35 years and present outputs for the Natural England recommended counterfactuals of population growth rate and population size. However, Natural England has outstanding concerns and clarification requests related to these updated PVAs and their outputs that have been raised during the Hornsea 3 Examination process in our Written Submission for Deadline 3 and in Appendix 2 of this document. These are currently under discussion during the Hornsea Project 3 examination, so we advise the SPR keeps a watch on the decisions made regarding suitability of these.	
Natural England	26/03/2019 Comments on the Draft HRA	We note that only features and sources of effect suggested by SPR as requiring assessment in relation to offshore ornithology for Outer Thames Estuary SPA, red-throated diver are disturbance and displacement during cable laying. However, given the close proximity of EA2 to the Outer Thames Estuary SPA, displacement effects from the windfarm during construction and operation also need to be assessed.	The East Anglia TWO boundary has been revised and this is reflected in the updated assessment.
Natural England	26/03/2019 Comments on the Draft HRA	4.2.1.3 – Outer Thames Estuary SPA, RTD: Natural England agrees with SPR's approach of estimating the magnitude of during construction disturbance (in relation to cable laying) to RTDs on a 'worst case' basis assuming that there would be 100% displacement of birds in a 2km buffer surrounding the cable laying vessels. However, there also needs to be an assessment of disturbance and displacement effects from the construction and operation of the array itself, not just the cable route.	Impacts have been assessed for which there is a justifiable evidence. In the case of construction of the East Anglia wind farm array, the distance between the wind farm and the SPA boundary means that this impact is not considered to be of concern.
Natural England	26/03/2019 Comments on the Draft HRA	4.2.1.3 – Outer Thames Estuary SPA, RTD: SPR has used the RTD densities calculated from East Anglia 3 for their offshore cable route through the SPA, which calculated densities using the JNCC data set used in the designation of the original Outer Thames Estuary SPA classification and from 2013 surveys of the SPA undertaken by	This aspect of the assessment has been updated following discussions with Natural England and advice received.

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		APEM. Although we note that the EA3 cable route passes a few kilometres south of the EA2 cable route, evidence needs to be presented to justify this approach rather than calculating the RTD densities from this data for the actual EA2 cable route. As noted above the assessment should not be restricted to the cable route only.	
Natural England	26/03/2019 Comments on the Draft HRA	4.2.1.3 Outer Thames Estuary SPA, RTD: The assessment of offshore cable laying disturbance/displacement for EA2 alone on RTD within the Outer Thames Estuary SPA have assumed that 5% of displaced RTD could die as a result of displacement by construction vessels. As noted for the EIA assessment of offshore cable laying, we advise consideration of a range of mortality rates of 1-10% are used for RTD assessments. As noted above the assessment should not be restricted to the cable route only.	The assessment has been updated to reflect advice received and reviews of available evidence.
Natural England	26/03/2019 Comments on the Draft HRA	4.2.1.4 Outer Thames Estuary SPA, RTD in-combination: SPR notes that the Outer Thames Estuary SPA contains several constructed or consented offshore wind farms. Consideration should be given to the in-combination disturbance/displacement effect on RTD of cable laying with the currently constructed or consented wind farms within the Outer Thames Estuary SPA. In addition to effects from cable laying, the potential impacts from the construction and operation of the EA2 and EA1N arrays need to be considered. Natural England advises that it is already is not possible to rule out an adverse effect on integrity on red throated diver from Outer Thames Estuary SPA in-combination with consented and operational OWF projects.	The assessment has been updated to reflect advice received and reviews of available evidence. The assessment concludes that no adverse effect on the integrity of the SPA as a result of in-combination effects is predicted. See ***section 4.2.1.6***.
Natural England	26/03/2019 Comments on the Draft HRA	4.3.2.3 Greater Wash SPA, little gull CRM: We agree with the approach undertaken to apportion collisions to the Greater Wash SPA little gull population.	Noted.

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Natural England	26/03/2019 Comments on the Draft HRA	4.3.2.3 Greater Wash SPA, little gull CRM: We note the methodological issues/uncertainties raised regarding the CRM undertaken, that there will be changes to the number of turbines at EA2 in the final submission and that additional data will also be included in the final submission. Therefore we currently cannot agree to these figures and hence reach any conclusions regarding the impact of collision risk from EA2 alone.	The assessment has been updated to reflect advice received and reviews of available evidence.
Natural England	26/03/2019 Comments on the Draft HRA	4.2.2.4 Greater Wash SPA, little gull in-combination CRM: SPR considers that given the extremely small potential impact on little gull due to collisions at EA2 alone that their assessment predicts, it is apparent that the project will not contribute to an in-combination impact. We note the methodological issues/uncertainties raised regarding the CRM undertaken for EA2 alone and that there may be changes in the predicted numbers in the final submission due to changes to the turbine numbers and addition of data. Therefore we recommend that the in-combination collision risk to little gulls from the Greater Wash SPA is revisited once these issues/uncertainties are resolved. We also advise that whilst the predicted EA2 CRM impact to little gulls from the Greater Wash SPA is likely to equate to less than 1% baseline mortality and could be considered non-significant and therefore would not be an AEOI. However, while 1% baseline mortality can be considered to be insignificant in the context of the population, this does not mean that this level of additional mortality should not be added to an assessment of in-combination impacts. Therefore, we advise that the in-combination CRM figures for other relevant North Sea offshore wind farms (OWFs) for little gull from the Greater Wash SPA are presented (where figures are available) and that the overall in-combination CRM figure is presented.	The assessment has been updated to reflect advice received and reviews of available evidence.

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Natural England	26/03/2019 Comments on the Draft HRA	Alde-Ore SPA, LBBG: We note that 25% of collisions have been apportioned to the Alde-Ore SPA during the breeding season and that is considered by SPR to be a worst case (precautionary) assumption. This has been calculated by simply summing the totals of counts from colonies within foraging range of EA2. We note that this approach does not take account of the distance each colony is from EA2 or segregation, which apportioning approaches should do. If the Alde-Ore is the closest of all the colonies within foraging range, then the apportionment approach may lack precaution (as may be that birds present are biased more towards the Alde-Ore), but if it is the colony located furthest away then the approach may be precautionary. SPR has calculated a figure of 5,400 adults for the non-SPA LBBG population with potential connectivity to the Alde-Ore (based on counts of 2,800 at Felixstowe Docks, 200 at Ipswich, 1,500 at Lowestoft and 900 at Norwich). We note that this does not include counts for all colonies within foraging range of EA2, although we appreciate that data may not be available for all locations within foraging range of EA2. SPR has then doubled the non-SPA colony figure of 5,400, which is partly due to the Lowestoft, Ipswich and Felixstowe estimates being from 2000, 2001 and 2013 respectively and SPR considering that these would therefore almost certainly have increased substantially in the interim. Given the potential for roof nesting urban colonies to be controlled, we would suggest that SPR provides evidence to justify this decision. We also note summed figure of 5,400 includes a count from Norwich from 2017, which should not require doubling, as this is a recent count.	The Applicant has updated the assessment taking into the advice received and further reviews of evidence available.

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		Based on the above Natural England is currently uncertain regarding the evidence base for 25% apportionment of impacts to LBBG during the breeding season. We advise SPR considers the advice provided during the Norfolk Vanguard examination, which is summarised in our main comments.	
Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.2 - Alde-Ore SPA, LBBG: We note that a figure of around 6,700 individuals of all ages is used by SPR as the Alde-Ore SPA LBBG population. This is based on a figure of 2,000 pairs, which is then multiplied by 2 to get the number of adults. This is then divided by 0.58 (on the basis that adults comprise approximately 58% of the population, Furness 2015). We note that this calculation actually equals 6,897 (or approx. 6,900, rather than the around 6,700 used by SPR).	The estimation of the population size has been updated following review of the assessment and the methods used.
Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.2 - Alde-Ore SPA, LBBG: We note that 3.3% of collisions have been apportioned to the Alde-Ore SPA during the autumn and spring migration seasons for EA2. This appears to be based on calculating the proportion the total Alde-Ore all ages LBBG population calculated by SPR (approx. 6,700) accounts for of the total relevant BDMPS seasonal population of LBBGs of all ages in Furness (2015). We consider this to be a precautionary approach (see below).	Noted.
Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.2 - Alde-Ore SPA, LBBG: We note that 10% of collisions have been apportioned to the Alde-Ore SPA during the winter season for EA2. We consider this to be an acceptable approach (see point below).	Noted.
Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.2 - Alde-Ore SPA, LBBG: We note that the Alde-Ore LBBG colony figure in the tables of Appendix A in Furness (2015) is 640 pairs. However, this is acknowledged to probably relate to birds at Orfordness and has not included 1,747 pairs at Havergate Island in 2013 (which will have been included in the non-SPA colonies figures).	The assessment has been updated to ensure use of a common currency and in line with this advice.

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		So whilst the total seasonal BDMPS figures for the UK North Sea and Channel autumn, winter and spring are considered appropriate to use in the apportionment calculations, the Alde-Ore colony figure is not. Therefore, we agree with SPR's use of the figure of 2,000 pairs of LBBG for the Alde-Ore SPA colony. Our preferred approach to the apportionment would be to use the colony figure of 2,000 pairs (or 4,000 adults) and the use of 0.58 as sued by SPR to get the all age colony figure, which we calculate to equal 6,897 – so if 4,000 of these are adults then the remaining 2,897 are immatures. We would then recommend using the information in the relevant tables in Appendix A of Furness (2015) on the proportions of adults and immatures from the Alde-Ore in each relevant seasonal BDMPS to get the total colony figures of adults or all ages to use in the apportionment. We also note that SPR's apportioning appears to be based on calculations of all ages. As the outputs of the existing PVAs tend to be on an adult currency, we would advise use of the proportion of ALL birds in the project area that are predicted to be ADULT birds from Alde-Ore SPA. As highlighted in our main comments, we also advise that calculations of baseline mortality used in the HRA are undertaken on an adult currency, therefore using the adult colony figure and the adult mortality rate rather than on all ages.	
Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.2 - Alde-Ore SPA, LBBG: As EA2 is located within the mean-maximum foraging range of LBBG from the Alde-Ore Estuary SPA, we consider that the full breeding season in Furness (2015) is the most appropriate for assigning monthly impacts to the breeding season, rather than the migration free breeding season as currently used by SPR. We also consider that the migration periods should then be adjusted accordingly to account for any overlapping of months in the definitions.	The assessment has been updated with the inclusion of consideration of impacts assigned using the full breeding season.

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Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.2 - Alde-Ore SPA, LBBG: Given the issues/concerns we have regarding how the EA2 CRM has been undertaken (detailed in our main comments) and that further baseline data are still to be added and the CRM re-run to include this and the increase to turbine numbers, at present the information in the PEIR does not allow conclusions to be reached regarding the significance of the impact of collision risk to LBBG from the Alde-Ore Estuary SPA from EA2 alone.	The assessment has been updated, as indicated in the responses to the detailed comments and the Applicant considers that the assessment presented will now enable Natural England to reach a conclusion on the potential for the project to have an impact on the population.
Natural England	26/03/2019 Comments on the Draft HRA	Table 4.4 – Alde Ore SPA, LBBG in-combination: As with the cumulative assessments, we welcome that SPR has included figures for the Norfolk Vanguard, Hornsea Project 3, Thanet Extension, EA1N and Norfolk Boreas projects in the in-combination assessment. We assume that the figures presented for the Norfolk Vanguard, Hornsea Project 3 and Thanet Extension have been obtained from the submission documents for these projects. We note that these projects are currently going through the examination phase, and that a number of issues/concerns have been raised with the figures presented for these projects. Therefore, we advise that in the final submission SPR updates the figures in the in-combination assessment for these projects with the final agreed figures following the completion of the examination of these projects. We also note that the figures presented for Norfolk Boreas and EA1N projects have been obtained from the PEIRs for these projects. We advise that in the final submission SPR updates the figures in the in-combination assessment for these projects with the submission figures (timescales allowing). We also note that the in-combination CRM assessment does not include figures for the Hywind, Kincardine and Moray West OWFs.	The in-combination assessment has included the most appropriate figures for other projects which could be identified, while acknowledging the fact that these may not be the final values in all cases since further updates to project designs are likely. The Scottish wind farms requested for inclusion by Natural England have now been added to the assessment (although it is worth noting that none of these sites predicted any collision for this species so these make no difference to the results obtained).

Consultee	Date / Document	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
Natural England	26/03/2019 Comments on the Draft HRA	Table 4.4 – Alde Ore SPA, LBBG in-combination: We again note that the figure included for EA2 are those using the migration free breeding season. We again recommend that the extended (full) breeding season with the migration seasons adjusted accordingly is used for LBBG from the Alde-Ore Estuary SPA.	The full breeding season has been included in the assessment.
Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.4 – Alde Ore SPA, LBBG in-combination: The total in-combination breeding season LBBG CRM is stated in paragraph 249 of the EA2 HRA report as 44.1 collisions. We note that this figure is based on only including CRM figures for wind farms located within the mean foraging range of 72km (i.e. the mean LBBG foraging range). We would recommend that the CRM figures for the breeding season for all windfarms within 141km from the Alde-Ore are also considered in the in-combination total.	The assessment has given further consideration to the range over which individuals from this population may forage and the assessment has been updated accordingly.
Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.4 – Alde-Ore SPA, LBBG in-combination: The in-combination mortality figures currently presented by SPR of up to 56 LBBGs attributable to the Alde-Ore Estuary SPA equates to 6.4% of baseline mortality, which is not insignificant and would require further assessment through population modelling. However, we note the methodological concerns highlighted regarding the EA2 alone CRM and that the EA2 alone figures are likely to change following inclusion of the remaining 3 months of data and the increase to the turbine numbers. Additionally the figures for some other the other projects included in the cumulative assessment may change come the final submission and that there are currently relevant OWFs that have not been included. Therefore, the information in the PEIR does not currently allow conclusions to be made by Natural England regarding the level of in-combination impact.	The in-combination assessment has been updated and reference has been made to the recent population modelling for this population conducted for the Norfolk Vanguard assessment. The updated assessment has confirmed the conclusion of the draft HRA and reaches a conclusion of no Adverse Effect on Integrity.

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Natural England	26/03/2019 Comments on the Draft HRA	4.4.1.4 – Alde Ore SPA, LBBG in-combination: We note that SPR has made reference to the outputs of the PVA undertaken at Galloper offshore wind farm for lesser black-backed gulls. SPR has referred to the reduction in population growth rate predicted from the PVA. Natural England considers that assessments should focus on the counterfactual of growth rate and the counterfactual of final population size, as these are the two metrics that are, in Natural England's opinion, least sensitive to mis-specification of the population trend and demographic rates used in the PVA model. These metrics should be calculated at the end of the impact period. Therefore, we note the issues around existing PVAs detailed in our main comments and therefore suggest that these are considered by SPR before any conclusions can be made regarding the significance of in-combination collision impacts on LBBG.	The updated assessment now makes reference to the recent population modelling presented for the Norfolk Vanguard project.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.1.3 – FFC SPA, gannet: We agree with the approach used to apportion 100% of predicted gannet collisions in the breeding season to birds from the FFC SPA, as this can be considered precautionary.	Noted.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.1.3 – FFC SPA, gannet: SPR has considered that during migration in autumn and spring, 4.2% and 5.6% (respectively) of the birds observed are predicted to originate from FFC SPA, based on numbers at the SPA and in the BDMPS population estimate and notes that this is the approach that was taken at EA3. For the apportionment of impacts of species to relevant SPA colonies during the non-breeding seasons, Natural England recommend that the data presented in the tables in Appendix A of Furness (2015) for the relevant species Biologically Defined Minimum Population Scales (BDMPSs) for each season (e.g. migration, winter etc.) are used. We would advise that the proportion the relevant colony figure represents	The assessment of nonbreeding apportioning to the SPA population has been updated in line with the percentages advised by Natural England.

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		of the total number of birds of all ages in the relevant BDMPS in the season in question is used as the apportionment figure. We do not recommend that the colony figures presented in the tables in Appendix A for the SPA colony in question are updated with more recent figures, unless there is evidence to suggest that the colony in question has increased or decreased relative to other colonies. Whether the colony figure in the BDMPS tables used is the adult figure or that for all ages depends on any Population Viability Analysis (PVA) model and outputs to be used. Given that the outputs of the existing PVAs tend to be on an adult currency, Natural England advises that calculations of baseline mortality used in the HRA are undertaken on an adult currency, therefore using the adult colony figure and the adult mortality rate rather than on all ages. Following this recommended approach, we have calculated apportionment rates of 4.8% for autumn and 6.5% for spring for gannet from the FFC SPA. Whilst the figures are similar to those used by SPR, we advise that SPR follow our recommended approach, as this is consistent with advice given to Hornsea Project 3 and Norfolk Vanguard and will ensure consistency in the non-breeding season apportionment approaches going forwards.	
Natural England	26/03/2019 Comments on the Draft HRA	4.5.1.3 – FFC SPA, gannet: Given the issues/concerns we have regarding how the EA2 CRM has been undertaken (detailed in our main comments) and that further baseline data are still to be added and the CRM re-run to include this and the increase to turbine numbers, at present the information within the PEIR does not allow conclusions to be reached regarding the significance of the impact of collision risk to gannet from the FFC SPA from EA2 alone. Additionally, displacement predictions for gannet at FFC SPA should be added to collision predictions for gannet at FFC SPA, and the combined impacts considered for EA2 alone and in-combination with	The assessment has been updated, taking into account advice from Natural England and the methods presented by other recent projects. This includes consideration for combined displacement and collision effects.

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		other relevant offshore wind farms. This should be considered in the final submission documents.	
Natural England	26/03/2019 Comments on the Draft HRA	Table 4.5 – FFC SPA, gannet in-combination: As noted in our main comments, we do not consider it appropriate to adjust the CRM figures for the other OWFs included in the in-combination assessment to account for use of the 'empirically derived' nocturnal activity rates for gannet from tracking studies.	The assessment has been updated and the adjustment of collisions at other projects no longer applies the evidence-based revision as used in the draft HRA but instead reverts to the previous estimates for those projects calculated using the generic and precautionary rate of 25%.
Natural England	26/03/2019 Comments on the Draft HRA	Table 4.5 – FFC SPA, gannet in-combination: We are uncertain of whether the apportioned figures to the FFC SPA for each offshore wind farm included in the in-combination assessment are for adults only or for birds of all ages. Where possible these figures should be based on common currency.	The assessment has been updated to ensure a common currency (adults) is used throughout.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.1.4 – FFC SPA, gannet in-combination: The predicted level of in-combination impact based on SPR's current figures equates to more than 1% of baseline mortality for the FFC SPA gannet colony population (based on an all age colony population size from the 2017 count and an all age mortality rate of 19.1%). This is not insignificant and would require further assessment through population modelling.	The assessment has been updated to include consideration of the consequence of the predicted impacts using the most recent population models available for this population. While the in-combination impact still exceeds 1% of baseline mortality the updated assessment concludes that there will be no adverse effect on the integrity of the FFC SPA. See ***section 4.5.1.6***.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.1.4 – FFC SPA, gannet in-combination: We note that SPR has made reference to the outputs of the PVA undertaken at Hornsea 2 offshore wind farm for gannets at FFC SPA. As noted in our main comments, Natural England recommends using the counterfactual of population growth rate and the counterfactual of population size to quantify the relative changes in a population in response to	The assessment now makes reference to the population models presented for Hornsea Project Three, as advised by Natural England.

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		anthropogenic impacts. Therefore, we note the issues around existing PVAs detailed in our main comments and therefore suggest that these are considered by SPR before any conclusions can be made regarding the significance of in-combination collision impacts on gannets from the FFC SPA. We also note that new PVAs have been undertaken for gannet, kittiwake and auks at FFC SPA as part of the Hornsea Project 3 examination. These are currently under discussion during the examination, so we advise SPR keeps a watch on the decisions made regarding suitability of these. We also note that the mortality currency of the PVA undertaken at Hornsea 2 (and the new PVAs for Hornsea 3) is adults. We assume that the EA2 alone figure and the in-combination total mortality figure calculated is for an all age mortality currency. If this is the case, then this needs to be considered by SPR.	
Natural England	26/03/2019 Comments on the Draft HRA	4.5.1.4 – FFC SPA, gannet in-combination: SPR also makes reference to the outputs of PBR, which was undertaken for the Rampion assessment and used at East Anglia 1. As SPR notes, Natural England no longer recommends the use of PBR and advises that assessments focus on stochastic PVA models. Therefore, as has been advised at EA3 and Norfolk Vanguard, we do not advise updating this PBR figure or that the PBR figures are used in coming to conclusions on appropriate assessment and advise that this is focused on the outputs of PVA models. However, we do note the increase in the colony gannet population noted by SPR.	The assessment has been revised and references to PBR have been removed.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.1.5 – FFC SPA, gannet conclusion: In addition to the above regarding population modelling, we note the methodological concerns highlighted regarding the EA2 alone CRM and that the EA2 alone figures are likely to change following inclusion of the remaining 3 months of data and the increase to the turbine numbers. Additionally the figures for some other the other projects included in the cumulative assessment may change come the final submission and	The assessment has been updated to include the full 24 months of survey data for East Anglia TWO and the most up to date estimates for other wind farms included in the in-combination assessment.

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		that there are currently relevant OWFs that have not been included. Therefore, the information in the PEIR does not currently allow conclusions to be made by Natural England regarding the level of in—combination impact.	
Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.2 – FFC SPA, kittiwake: SPR discusses RSPB tracking data of kittiwakes from the FFC SPA colony conducted between 2010 and 2013. We note that more recent tracking has been undertaken with kittiwakes from Flamborough Head tracked between 2010-2015 and 2017, Filey Brigg in 2013-15 and 2017 and Speeton in 2017. The results of these do indicate that birds from the FFC SPA do forage within the East Anglia Zone. Therefore we advise that SPR requests this data/reports from the RSPB and considers it in the final submission documents.	The assessment has been updated to take account of the results of the more recent tracking studies by the RSPB.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.3 – FFC SPA, kittiwake: SPR has apportioned 16.8% of kittiwake collisions in the breeding season to the FFC SPA and this is considered by SPR to be a precautionary estimate. The tracking data up until 2015 suggests low connectivity of the EA2 site with foraging birds from the colony and this, together with the evidence presented by SPR for distributions of immature kittiwakes during the breeding season, suggests that the logic presented by SPR for arriving at this apportionment figure is correct. However, further tagging of kittiwakes from the FFC SPA colony has been undertaken in 2017 and the results of this does indicate that birds from the FFC SPA do forage within the East Anglia Zone. Therefore, we recommend that SPR requests this data/reports from the RSPB and considers this in the final submission documents.	The assessment has been updated to take account of the results of the more recent tracking studies by the RSPB.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.3 – FFC SPA, kittiwake: SPR has apportioned 5.4% of collisions to the FFC SPA in autumn and 7.2% in spring using the approach undertaken at EA3. The approach calculates the proportion of birds in the project area that are predicted to be adult birds from FFC SPA in	The assessment has been updated to ensure consistent use of a common currency for impacts.

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		the autumn or spring North Sea BDMPS based on Furness (2015). We do not disagree with this approach, but note that this has considered the proportion of adult birds only, which is different to the approach taken for LBBG at the Alde-Ore. However, for kittiwake SPR has then assessed the impact of the predicted collision figures against baseline mortality calculated using an all age colony figure and an all age survival rate. We do not consider this to be appropriate as if the proportion of birds in the project area that are FFC SPA adults has been calculated then SPR should assess the significance of this by calculating what percentage of baseline mortality this represents for the adult component of the FFC SPA population.	
Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.3 – FFC SPA, kittiwake: Given the issues/concerns we have regarding how the EA2 CRM has been undertaken (detailed in our main comments) and that further baseline data are still to be added and the CRM re-run to include this and the increase to turbine numbers, at present the information in the PEIR does not currently allow conclusions to be made regarding the level of impact.	The assessment has been updated, taking into account advice from Natural England and the methods presented by other recent projects and is now considered to be complete.
Natural England	26/03/2019 Comments on the Draft HRA	Table 4.6 – FFC SPA, kittiwake in-combination: As noted in our main comments, we do not consider it appropriate to adjust the CRM figures for the other OWFs included in the in-combination assessment to account for use of the 'empirically derived' nocturnal activity rates for gannet from tracking studies.	The assessment has been updated and the adjustment of collisions at other projects for lower nocturnal activity levels has been removed.
Natural England	26/03/2019 Comments on the Draft HRA	Table 4.6 – FFC SPA, kittiwake in-combination: We are uncertain of whether the apportioned figures to the FFC SPA for each offshore wind farm included in the in-combination assessment are for adults only or for birds of all ages. We understand that the apportioned figures for EA2 are in adult currency. Where possible these figures should be based on common currency.	The assessment has been updated to ensure consistent use of a common currency for impacts.

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Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.4 – FFC SPA, kittiwake in-combination: The in-combination mortality figures currently presented by SPR of up to 332 kittiwakes attributable to the FFC SPA equates to 1.5% of baseline mortality, which is not insignificant and would require further assessment through population modelling.	Further assessment has been conducted including reference to the outputs from the Hornsea Project Three population modelling.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.4 – FFC SPA, kittiwake in-combination: We note that SPR has made reference to the outputs of the PVA undertaken at Hornsea 2 offshore wind farm for kittiwakes at FFC SPA. As noted in our main comments, Natural England recommends using the counterfactual of population growth rate and the counterfactual of population size to quantify the relative changes in a population in response to anthropogenic impacts. Therefore, we note the issues around existing PVAs detailed in our main comments and therefore suggest that these are considered by SPR before any conclusions can be made regarding the significance of in-combination collision impacts on gannets from the FFC SPA. We also note that new PVAs have been undertaken for gannet, kittiwake and auks at FFC SPA as part of the Hornsea Project 3 examination. These are currently under discussion during the examination, so we advise SPR keeps a watch on the decisions made regarding suitability of these. We also note that the mortality currency of the PVA undertaken at Hornsea 2 (and the new PVAs for Hornsea 3) is adults. We assume that the EA2 alone figure and the in-combination total mortality figure calculated is for an all age mortality currency. If this is the case, then this needs to be considered by SPR.	Further assessment has been conducted including reference to the outputs from the Hornsea Project Three population modelling.
Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.4 – FFC SPA, kittiwake in-combination: SPR also makes reference to the outputs of PBR, which was undertaken for the Hornsea 1 assessment. As SPR notes, Natural England no longer recommends the use of PBR and advises that assessments focus on stochastic PVA models. Therefore, we do not advise that the PBR	References to PBR have been removed from the assessment.

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		figure is used in coming to conclusions on appropriate assessment and advise that this is focused on the outputs of PVA models.	
Natural England	26/03/2019 Comments on the Draft HRA	4.5.2.5 – FFC SPA, kittiwake conclusion: In addition to the above regarding population modelling, we note the methodological concerns highlighted regarding the EA2 alone CRM and that the EA2 alone figures are likely to change following inclusion of the remaining 3 months of data and the increase to the turbine numbers. Additionally the figures for some other the other projects included in the cumulative assessment may change come the final submission and that there are currently relevant OWFs that have not been included. Therefore, no conclusions are made by Natural England regarding the level of in-combination impact. We note that at East Anglia 3 Natural England concluded that we could not rule out beyond significant doubt an adverse effect on integrity for kittiwake from the FFC SPA due to in-combination collision mortality. As there have been no changes in CRM methodology since East Anglia 3 in terms of avoidance rates etc., and that more collisions are being added to these totals from the additional projects currently under examination (Hornsea 3, Norfolk Vanguard and Thanet Extension) and those currently at PEIR stage (Norfolk Boreas, EA2, EA1N) it is considered unlikely this position will change. Therefore, we would advise that SPR gives consideration to mitigation measures which seek to reduce their project's contribution to cumulative/in-combination total impacts.	The assessment has been updated in line with advice received and taking account of other wind farm assessments. The Applicant acknowledges Natural England's suggestion with regards to the likelihood of an in-combination impact, but considers that this is a reflection of several independent sources of precaution in the assessment and that both for the project alone and in-combination there will not be an Adverse Effect on the Integrity of this population.
RSPB	25/03/2019 Section 42 comments	HRA: apportioning lesser black-backed gulls Paragraph 240 (p.98) refer to the calculation of a reference population using Norfolk Vanguard (2018), which seeks to apportion lesser black-backed gull collisions to specific colonies (see also Paragraph 231 and Paragraph 237 (p.57) of the EA2 HRA). We disagreed with the calculation of the non-SPA element of this and the subsequent apportioning of 25% of breeding birds at the Norfolk	The Applicant welcomes the RSPB's comments on estimating the reference population for lesser black-backed gulls. Given that this draws on many similar data sources, not surprisingly this review reaches conclusions which are similar to those in the updated assessment (e.g. that Alde Ore Estuary comprises approximately 25% of the

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		Vanguard windfarm site to the Alde-Ore Estuary SPA for a number of reasons (note also that EA1N and EA2 are significantly closer to the AOE SPA than Vanguard). The RSPB considers that the apportioning of 25% of collision risk to the Alde-Ore Estuary SPA is not sufficiently supported by evidence in two key areas: the estimation of the non-SPA lesser black-backed gull population and its likely growth rate, and the assumption that urban and inland gulls are likely to forage at sea to the same level as rural coastal birds. Whilst we acknowledge the difficulties arising from the lack of recent census data for urban gull colonies, the approach taken by the Applicant to estimate the urban gull population in Norfolk and Suffolk is speculative and lacking in precaution. A key source of information, the Seabird 2000 census, is missing from the cited colony counts and no evidence is provided for the rate chosen to account for colony growth since the last counts. The Seabird 2000 census carried out in 1999 – 2002 (Mitchell et al., 2004) recorded 1149 apparently occupied nests (AON) in Suffolk roof-nesting colonies, 1605 AON in Norfolk coastal colonies, and 1456 in Suffolk Coastal colonies (excluding the SPA colony at Orfordness). This gives a total of 4210 AON outside the SPA, or 8420 adult birds. We acknowledge that these data do not include roof-nesting birds in Norfolk, and that the counts of roof-nesting birds are thought to be underestimated. More recent work by Coulson and Coulson (2015) suggests that results from the vantage point surveys of roof-nesting birds carried out for Seabird 2000 should be multiplied by 1.33 to correct for under-detection of nests. This would raise the number of adult birds in Norfolk and Suffolk to 9178 when the roof-nesting numbers for Suffolk are corrected in this way. Given that Norfolk is likely to be similar to Suffolk in terms of urban habitats available, it may be appropriate to double the numbers of urban birds in Suffolk to account for the missing Norfolk data. This would give a total non-SPA	regional population). However, the Applicant disagrees with the RSPB's suggestion that urban gulls should be completely disregarded, as the evidence for distinctions in preferred foraging locations for urban and rural gull colonies indicates that both are equally likely to forage at terrestrial and marine locations, and does not support the clear distinction in habits proposed by the RSPB. Therefore, the assessment as presented is considered robust, is agreed with NE, and the interpretation presented by the RSPB provides additional support.

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		population of 12,234 adult birds, or 21,093 birds of all ages (assuming adults comprise 58% of the population, Furness, 2015), of which 10,539 are from urban colonies in Norfolk and Suffolk. JNCC (2018) discuss the growth rate of lesser black-backed gull colonies since the Seabird 2000 census, and conclude that there is insufficient evidence to allow a trend to be identified. Colonies display differing trends, due to differences in factors affecting their growth rate. Many large coastal colonies have undergone significant declines, including that of the Alde-Ore Estuary SPA at Orfordness, whilst some urban colonies, particularly in the south-east and north-west are known to have increased significantly. Given that JNCC (2018) cannot specify trend figures, and that the non-SPA population for Norfolk and Suffolk includes both urban colonies (likely to have increased) and rural coastal colonies (may have decreased), we therefore do not consider it safe to propose an overall level of population change for the non-SPA population since the Seabird 2000 census. There is also no discussion of the differences in foraging behaviour between urban and inland colonies and rural, coastal colonies. Whilst the evidence available is limited, some studies of lesser black-backed gull diet are available. Coulson and Coulson (2008) found no offshore marine component (i.e. fish or fish offal) in the diet of the lesser black-backed gull colony in Dumfries, in an analysis of regurgitated pellets. Food sources were predominantly agricultural (55% of pellets), from landfill sites (23%) or intertidal habitats (12%). Similarly, at an inland colony in the Netherlands (c.30km from the North Sea), Gyimesi et al. (2016) found no marine remains in an analysis of pellets and boluses, and found only 2 of 710 trips recorded by GPS tags visited the North Sea. Conversely, at two rural island colonies in the south-eastern North Sea, Kubetzki and Garthe (2003) found that 80% of lesser black-backed gull pellets contained prey from coastal waters. Given this difference, we do not consider it safe to assume that birds from	

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		urban colonies will forage at sea to the same extent as those birds from rural coastal colonies, including the Alde-Ore Estuary SPA. There is an argument therefore, to exclude urban populations when considering apportioning to the SPA. Using the Applicant's calculation of 6,700 birds of all ages associated with the SPA, the apportioning to the Alde-Ore SPA would therefore be between 24.1% if urban birds are included (6700/21093 + 6700) and 38.8% when urban birds are excluded (6700/10555 + 6700). Given the discussion above, the lower figure (which is close to the Applicant's proposed 25%) is clearly unrealistic, and a figure likely to be at least 35% would be more appropriate. However, the RSPB further advocate the use of the theoretical approach as laid out in SNH guidance (SNH 2018). This theoretical approach is based on foraging range and three colony-specific weighting factors: colony size, distance of colony from site and the areal extent of the open sea within the foraging range of the relevant species.	
Eastern IFCA	12/03/2019 Section 42 Comments	The Outer Thames Estuary Special Protection Area (SPA) Eastern IFCA also recognises that the proposed activities have the potential to cause disturbance and displacement of non-breeding Red-throated divers due to the presence of the cable laying vessels installing the export cable in the Outer Thames Estuary SPA. Foraging Red-throated Divers are "considered sensitive to disturbance by noise and visual presence caused by anthropogenic activities during the winter" (Garthe and Huppop, 2004), and disturbance "can cause these birds to reduce or cease feeding in a given area or to be displaced" (JNCC and Natural England, 2013). The relevant conservation objective for the Outer Thames Estuary SPA is "subject to natural change, maintain or enhance the Red-throated diver population and its supporting habitats in favourable condition" (JNCC and Natural England 2013).We defer to Natural	Noted. Advice has been sought from Natural England on the approach to the assessment of impact on the Outer Thames Estuary SPA.

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		England and the JNCC for detailed conservation advice including any need to consider other activities that could cause cumulative impacts to sensitive species or habitats.	
Natural England	ETG 4 Meeting 20/06/2019	Full migration season (Apr-Aug) to be used for breeding season for Lesser Black-Backed Gull due to proximity to Alde-Ore colony.	Acknowledged, the full migration season (Apr-Aug) has been used for the breeding season for lesser-black-backed gull.

2.1.4 Marine Mammals Draft HRA Section 42 Comments

Table A2.3 Consultation Responses on the Draft HRA Related to the Marine Mammals

Consultee	Date	Document	Comment	Response / Where Addressed in the Information to Support Appropriate Assessment Report
Natural England	2nd October 2018	EA2 & EA1N HRA Screening reports	Natural England would also like to request further information on the likelihood of the projects being constructed in parallel or sequentially. Both of these construction scenarios have the potential to alter the effects anticipated for protected site receptors. Especially if there is a gap between the completion of the first project and commencement of the second as this may affect the recoverability of receptors.	Details of the offshore infrastructure construction scenarios that have been assessed are presented in ***section 5.1*** of this Information to Support Appropriate Assessment report. Details of the in-combination effects considered for marine mammals are presented in ***sections 5.3***, ***5.4***, and ***5.5***.
Natural England	2nd October 2018	EA2 & EA1N HRA Screening reports	Natural England believes that six tiers is overly complicated for the in-combination assessment. Recent wind farms have had three or four tiers. Tiers 1 and 2 could easily be combined, especially as they are unlikely to overlap with EA2 or EA1N.	The tiered approach for the in-combination assessment has been reviewed, and options to reducing to three tiers considered. However, we think that the proposed approach of six tiers is the most appropriate approach to reflect the different stage of the developments for the in-combination assessment.
Natural England	2nd October 2018	EA2 & EA1N HRA Screening reports	Determination of Likely Significant Effect (LSE): Natural England is content with the marine mammal screening conclusions for both EA2 and EA1N and agrees with the three sites which have been screened in for further consideration, namely: the Southern North Sea cSAC / SCI, the Humber Estuary SAC and the Wash and North Norfolk Coast SAC.	Acknowledged and the three sites have been assessed further in ***sections 5.3, 5.4,*** and ***5.5*** of this Information to Support Appropriate Assessment report.

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Natural England	2nd October 2018	EA2 & EA1N HRA Screening reports	Paragraph 206: It is unclear to Natural England, why after paragraph 182, where it is detailed that grey seals can forage up to 100km (or further) from their haul out sites; changes to prey resources at the site and 40km buffer have been screened out from further assessment. Further information will be required to provide evidence that this is not an area used by seals for foraging. Natural England has the same query for harbour seals.	This has been reviewed, and in this Information to Support the Appropriate Assessment report, consideration is given to designated sites within 100km of the offshore development area where grey seal are a qualifying feature and designated sites within 80km of the offshore development area where harbour seal are a qualifying feature to determine the potential effects of any changes to prey resources.
Natural England	2nd October 2018	EA2 & EA1N HRA Screening reports	Paragraph 222: Contrary to what is written in this paragraph a southern port (e.g. Great Yarmouth) is much closer to the Wash and North Norfolk Coast SAC than a port to the north.	Vessel movements between the East Anglia ONE North offshore development area and a southern port, such as Great Yarmouth would not pass or enter the Wash and North Norfolk Coast SAC, therefore there would be no increased risk of collision risk within the Wash and North Norfolk Coast SAC. However, as outlined in the HRA screening (paragraph 223), the number of vessel movements in relation to the existing vessel traffic has been assessed for any potential effects on the Wash and North Norfolk Coast SAC in ***section 5.4.3.1.4*** of this Information to Support Appropriate Assessment report.

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Natural England	2nd October 2018	EA2 & EA1N HRA Screening reports	Table 7.3: Natural England notes that several of the SACs in Belgium, France and the Netherlands are closer than the UK seal sites. These sites should perhaps be screened back in and taken forward into the HRA as well.	As outlined above, this has been reviewed, and in this Information to Support Appropriate Assessment report consideration is given to designated sites within 100km of the offshore development area where grey seal are a qualifying feature and designated sites within 80km of the development area where harbour seal are a qualifying feature to determine the potential effects of any changes to prey resources.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC agree with the list of cetacean species that have been screened in to the HRA. We are pleased to see the potential effects that have been scoped in table 7.1, and listed in 7.1.3 and agree this is an appropriate list of potential effects. Additionally, we agree with the list of potential effects in 7.1.4.1.1 of underwater noise during construction, during operation and maintenance and during decommissioning.	Acknowledged and the potential effects have been assessed further in ***sections 5.3, 5.4, and 5.5*** of this Information to Support Appropriate Assessment report.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC recommend that vessel activity is included in the in-combination assessment as increased vessel noise can interrupt harbour porpoise (*Phocena phocena*) foraging behaviour and echolocation, which can lead to significantly fewer prey capture attempts (Wisniewska et al., 2018). Harbour porpoises have a high metabolism and need to feed constantly and therefore are highly sensitive to disturbance (Wisniewska et al., 2016), and can lose 4% of	Disturbance from vessel noise has been assessed in ***section 5.3.5.1.4*** of this Information to Support Appropriate Assessment report and was screened in during the HRA screening (***section 7.1.5*** of HRA screening report; ***Appendix 1***).

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			their body weight in just 24h from starvation (Harbour porpoise (*Phocoena phocoena*) energetics and fish catch ability related to offshore pile driving. Ron Kastelein http://inpas.nl/).	
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC are pleased to see that harbour porpoise and the SNS cSAC / SCI have been screened in, we agree this is appropriate. We agree that the precautionary approach is the best approach to ensure there is no Likely Significant Effect (LSE) on the SNS cSAC/ SCI.	The potential effects on the SNS SAC have been assessed in ***section 5.3*** of this Information to Support Appropriate Assessment report.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	EA2 is within the winter area of the SNS cSAC/ SCI, and EA1N overlaps both winter and summer areas of the SNS cSAC/SCI. One of our main concerns surrounds that the assessment on the harbour porpoise population in the SNS cSAC/ SCI is not being based upon the population of the site, but against the North Sea Management Unit. The HRA must take into account the draft Conservation Objectives - that the site integrity must be maintained and there is no adverse impact on the population of harbour porpoise at the site (JNCC, 2016). Site based protection cannot be met by assessing the whole North Sea population, but only by assessing the impacts for the number of individuals that are supported by the site (Rees et al., 2013).	Impacts for the SNS SAC have been assessed against the North Sea Management Unit (MU) population, as recommended by Natural England. However, as requested by TWT and WDC, and agreed as part of the EPP, a separate assessment was provided to the ETG with consultation on the draft HRA and PEIR for information only, based on the estimate that the SNS SAC could support 29,384 harbour porpoise (SCANS-III data for 17.5% of the UK North Sea MU).

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WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC acknowledges that the advice from the SNCB's, and within the SNS Site Selection Document, is "*because this estimate is from a one-month survey in a single year it cannot be considered as a specific population number for the site. It is therefore not appropriate to use site population estimates in any assessments of effects of plans or projects (i.e. Habitats regulation Assessments), as these need to take into consideration population estimates at the MU level, to account for daily and seasonal movements of the animals*" (JNCC, 2017). WDC strongly disagree with this advice, and have raised this issue in previous discussions. The European Commission guidance on managing Natura 2000 sites also states that the integrity of the site (habitat and species) must be maintained (European Commission and Office for Official Publications of the European Communities, 2000).	See previous response.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC recommended that there is an assessment on SNS cSAC/ SCI site harbour porpoise population that may be impacted by the development, and that this should be based on the latest SCANS III data. We are pleased that during discussions in the marine mammal expert topic group meetings, it was agreed that there will be an appendix to the marine mammal chapter which will include an additional assessment on the number of the harbour porpoise population of the cSAC/ SCI that may be impacted by the development, based on SCANS III data.	See previous response.

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WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC acknowledge that mitigation will be included in Stage 2 of the of the HRA Screening Assessment, and the detail for the mitigation of underwater of noise from unexploded ordnance clearance and piling activities will be produced post consent and detailed in the Marine Mammal Mitigation Protocol (MMMP); we request to be consulted on the design of the MMMP.	As outlined in ***section 5.1,*** the MMMPs for piling and UXO clearance will be developed in the pre-construction period in consultation with the relevant SNCBs and the MMO, it is also proposed to include WDC and TWT in this consultation process.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC has previously raised concerns regarding the JNCC guidance on mitigation methods for minimising the risk of injury to marine mammals from piling noise, additionally the JNCC guidance on piling (JNCC, 2010) is out of date and requires reviewing. Increasingly these methods are being widely criticised as arbitrary and with a lack of supportive evidence (Faulkner et al., 2018; Wright and Cosentino, 2015). Additionally, the guidelines have not been updated for a number of years and therefore do not include the latest and increasing body scientific data of the impacts of noise on marine mammals (Wright and Cosentino, 2015). Our concerns with the SNCB guidance on noise management within mobile species marine protected areas (MPAs), and our views and recommendation are outlined in appendix 1.	As outlined in ***section 5.1***, the MMMPs for piling will be developed in the pre-construction period and will be based upon best available information, methodologies and industry best practice at the time to reduce the risk of physical or permanent auditory injury (PTS) to marine mammals during all piling operations.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	We acknowledge that SPR are committed to using the latest mitigation measures and that these technologies change as new technologies are likely to emerge closer to the construction window. Without knowing which mitigation methods will be used it will be impossible to ensure that	As outlined in ***section 5.1,*** the Applicant is committed to ensure that the most adequate, effective and appropriate mitigation measures to reduce the risk of physical or permanent auditory injury (PTS)

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			there will be no in LSE.	to marine mammals are used during all piling and UXO operations so that there will be no LSE.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	WDC recommend that only mitigation methods that are proven should be considered. Studies at full scale offshore wind farms have shown that the use of bubble curtains during pile driving activities can reduce the disturbance area on harbour porpoises from ~15 km to ~5 km compared to piling with no mitigation, totalling ~90% reduction in harbour porpoise disturbance area (Nehls et al., 2016). Additionally, bubble curtains may reduce temporary habitat loss and risk of hearing loss in harbour porpoises (Dähne et al., 2017).	As outlined in ***section 5.1***, the MMMPs for piling will be developed in the pre-construction period and will be based upon best available information, methodologies and industry best practice at the time to reduce the risk of physical or permanent auditory injury (PTS) to marine mammals during all piling operations.
WDC	22nd September 2018	EA2 & EA1N HRA Screening reports	A study analysing benefits of noise reduction to harbour porpoise during offshore wind construction found that if wind farms inside the Southern North Sea cSAC/ SCI reduced their noise levels by the equivalent of around 8dB, the risk of a 1% annual decline in the North Sea porpoise population can be reduced by up to 66% (WWF, 2016). Such an approach is the only way to reduce the far reaching avoidance distances for cetaceans.	The East Anglia ONE North SIP will be developed and will set out the approach to deliver any necessary project mitigation or management measures in relation to the SNS SAC for harbour porpoise. The SIP has been proposed as an adaptive management tool, which can be used to ensure that the most adequate, effective and appropriate measures, if required, are put in place to reduce the significant disturbance of harbour porpoise in the SNS SAC. An In principle SIP has been submitted with this DCO Application (document reference 8.17) and is secured under the requirements

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				of the draft DCO.
TWT	26th September 2018	EA2 & EA1N HRA Screening reports	In-combination assessment: Are there any other construction activities within the Southern North Sea area which should be included? The main focus is currently on offshore wind farm construction. TWT recommend shipping and fishing should be included in the in-combination assessment. With regards to shipping and vessel movement, the Heinänen and Skov (2015) metric can be used as an assessment tool. With regards to fishing, this is a licensed activity that can have negative impacts on the environment and therefore not part of the baseline.	The in-combination assessment includes all potential in-combination effects from other projects activities during construction and operation, this includes other offshore windfarms, UXO clearance and seismic surveys as agreed with NE through the EPP. Shipping and fishing activity is considered part of the existing baseline, as they have existed in the North Sea for a long time before any offshore windfarm construction. It is also considered more appropriate for shipping and fishing activity to be assessed as part of a more strategic assessment rather than project / developer led assessment. The Heinänen and Skov (2015) threshold for the disturbance of harbour porpoise has been used in the assessment (***section 5.3.5.1.4*** and ***section 5.3.5.2.3***).
TWT	26th September 2018	EA2 & EA1N HRA Screening reports	UXO clearance: In order for a more accurate assessment to be undertaken, we suggest that surveys are undertaken as part of the evidence plan process to give better estimates on the number of UXO clearances required.	A detailed UXO survey will be completed prior to construction.

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TWT	26th September 2018	EA2 & EA1N HRA Screening reports	Assessment for the Southern North Sea SCI: For information, The Wildlife Trusts do not agree with the draft SNCB advice on underwater noise management (10/20% thresholds). We advocate the use of noise limits. We are also proposing the development of an underwater noise levy to support strategic monitoring and mitigation, which would be captured as a condition of a DCO.	Acknowledged.
TWT	26th September 2018	EA2 & EA1N HRA Screening reports	Underwater noise mitigation: We expect that mitigation will be required for in-combination impacts in the Southern North Sea SCI. Welcome a discussion regarding this at the next meeting to consider what mitigation will be required and how this should be presented. For example, if a SIP is to be prepared, we will expect to see evidence and modelling to show the effectiveness of proposed mitigation methods.	All proposed mitigation in the SIP will be based the suitability and effectiveness of mitigation measures, based on best available information, methodologies, industry best practice, latest scientific understanding and current guidance. An In principle SIP has been submitted with this DCO Application (document reference 8.17) and is secured under the requirements of the draft DCO.
TWT	26th September 2018	EA2 & EA1N HRA Screening reports	Post-consent engagement: We would welcome an early discussion on post-consent engagement with you on EA1N and EA2. SPRs approach to engagement for existing projects such as EA1 has shown best practice within the industry, and we hope this can be reflected in future projects.	Acknowledged and a similar approach to the consultation processes for East Anglia ONE is planned for East Anglia ONE North and East Anglia ONE North post-consent.

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Natural England	Section 42 Consultation	Draft HRA	As per Natural England's previous advice, a mechanism needs to be developed by the regulators to ensure continuing adherence to the SNCB thresholds over time. Multiple SIPs will be developed, piling can take place over several years, and new projects can come online during this time. Should potential exceedance of the thresholds occur, a process for dealing with this issue needs to be in place – the affected developers / industries will need to work together with the regulator and SNCBs to prevent adverse effect on the SCI.	Developing the SIP for both piling and UXO clearance in the pre-construction period will allow for a detailed review and assessment of the most effective and appropriate mitigation methods at that time, based on the latest scientific evidence to reduce underwater noise impacts, including the review of the best available mitigation techniques. An In principle SIP has been submitted with this DCO Application (document reference 8.17) and is secured under the requirements of the draft DCO.
Natural England	Section 42 Consultation	Draft HRA	Until the mechanism by which the SIPs will be managed, monitored and reviewed is developed, Natural England are unable to advise that this approach is sufficient to address the in-combination impacts and therefore the risk of Adverse Effect on Integrity on the Southern North Sea SCI cannot be fully ruled out.	Developing the SIP for both piling and UXO clearance in the pre-construction period will allow for a detailed review and assessment of the most effective and appropriate mitigation methods at that time, based on the latest scientific evidence to reduce underwater noise impacts, including the review of the best available mitigation techniques. An In principle SIP has been submitted with this DCO Application (document reference 8.17) and is secured under the requirements of the draft DCO

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				The mechanism by which the SIPs will be managed, monitored and reviewed is beyond the scope of the project.
Natural England	Section 42 Consultation	Draft HRA	As stated in paragraph 326, the SNCB guidance advises that the effect of the project should be considered in the context of the seasonal component of the SNS SCI rather than the SCI as a whole. Paragraph 351 then goes on to explain that the mean annual density will be used in the assessment. Natural England advises the winter density should be used for EA2 and both the summer and winter densities should be used for the proportion of the site in those areas for EA1N.	The East Anglia ONE North windfarm survey area estimate of 0.58/km^2, based on the mean annual density and using the seasonal correction factors, has been used to inform the assessments of impact. Using the mean annual density allows for seasonal variation in the number of harbour porpoise that could be present within the site, and the seasonal variation in the nature of activities that will be undertaken over the construction period.
Natural England	Section 42 Consultation	Draft HRA	Natural England considers the SNCB guidance should be used when assessing impacts to harbour porpoise from piling noise and UXO noise for the Southern North Sea SCI. Assessment against the MU should not be required.	As stated within the Conservation Objectives for the SNS SAC, the assessment of effects on the site should take into account the harbour porpoise population at the MU level (JNCC and Natural England 2019). The assessment against the MU has been included with the spatial and temporal assessments for both UXO clearance and piling to provide context of the number of individuals that may be affected as part of the wider harbour porpoise population. This approach was requested by NE during scoping (SPR 2017).

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Natural England	Section 42 Consultation	Draft HRA	The tiers that projects are placed in will need to be revisited and updated prior to submission and any changes followed through in to the cumulative impact assessment both for the EIA and HRA.	These have been updated within this Information to Support the Appropriate Assessment report, ***section 5.2.5.5.1***.
Natural England	Section 42 Consultation	Draft HRA	Paragraph 593 refers to figures 8 and 9, however figures 8 & 9 do not show concurrent piling at all 4 windfarms. Figure 8 shows concurrent piling locations at East Anglia 2 and figure 9 is not included.	***Figure 8*** of this Information to Support the Appropriate Assessment report shows concurrent piling at all offshore wind farm projects, except for East Anglia ONE North which will have no concurrent piling, for those projects that are in the winter area, or that area within 26km of the winter area. ***Figure 9*** of this Information to Support the Appropriate Assessment report shows concurrent piling at all offshore wind farm projects, except for East Anglia ONE North which will have no concurrent piling, for those projects that are in the summer area, or that are within 26km of the summer area.
Natural England	Section 42 Consultation	Draft HRA	To clarify, a Site Integrity Plan (SIP) is a document that SPR should produce to demonstrate their project in-combination with other plans and projects, will not have an adverse effect on site integrity on the Southern North Sea SCI. The text in paragraph 598 of the EA2 HRA implies that SPR is assuming another party will be producing a SIP for each of the projects.	The text in ***paragraph 598*** has been clarified to state that the Applicant will develop a SIP for the SNS SAC. An In principle SIP has been submitted with this DCO Application (document reference 8.17) and is secured under the requirements of the draft DCO.

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Natural England	Section 42 Consultation	Draft HRA	It should be noted that it has not been determined yet who will manage the process of reviewing the SIP documents and determining any further mitigation that may be required.	Noted. The reference to management of the SIP by the MMO has been removed.
Natural England	Section 42 Consultation	Draft HRA	The definitions of the seasons are taken from the SNCB threshold guidance for the SNS SCI, it is not for the MMO to manage when these seasons start and finish as implied in paragraph 604 of the EA2 HRA.	Noted. The reference to management of the number of days of piling within each season has been removed.
Natural England	Section 42 Consultation	Draft HRA	For a single UXO detonation the area of impact is given as 2,124 km^2 which in the EA2 HRA is given as 16 % of the winter area and in the EA1N HRA is given as 16.7 % of the winter area. Please could clarification be provided as to which is the correct figure.	A single UXO detonation in the winter portion of the SNS SAC (2,124km^2) would be 16.7% of the winter area. This has been clarified within this Information to Support the Appropriate Assessment report, ***section 5.2.5.1.1***.
Natural England	Section 42 Consultation	Draft HRA	Does the 'area of the offshore windfarm sites' used in this assessment include everything within the red line boundary, including the cable routes or is it limited to the area of the array? Clarification should be provided.	Within ***section 5.2.5.5.2.3***, the assessment of potential temporary disturbance activities during offshore wind farm construction (other than piling) has been based on the area of the offshore wind farm array only.
Natural England	Section 42 Consultation	Draft HRA	Natural England does not agree that just because the vessels will use existing vessel routes to and from windfarm sites, the increased risk of vessel interaction is therefore limited to the windfarm site. There is an increased level of collision risk due to an increased number of vessels and vessel movements.	The increase in vessels associated with the East Anglia ONE North project using existing vessel routes, would not result in a significant increase in the number of vessels currently using these routes, therefore there would be no significant increase in the potential collision risk for marine mammals

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				along these routes.
Natural England	Section 42 Consultation	Draft HRA	Natural England queries how the figure of 5% has been arrived at as an increased collision risk?	As stated in ***section 5.2.5.1.6*** of this Information to Support the Appropriate Assessment report, the potential for 5% of harbour porpoise present within the project areas to be at increased risk of collision is based on the available information on harbour porpoise stranding's and post mortems within UK waters and the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) area.
Natural England	Section 42 Consultation	Draft HRA	Paragraphs 674 of the EA2 HRA appears to say there is a 5% increased collision risk and paragraph 675 of the EA2 HRA then appears to state there should be no potential for increased collision risk with vessels. Please could this be clarified.	As a worst-case scenario the assessment has been based on the potential for a 5% increased collision risk for marine mammals in the area. However, this is very precautionary, therefore taking into account that vessels within the wind farm and cable corridor would be stationary or very slow moving, there would be no increased collision risk with vessels.
Natural England	Section 42 Consultation	Draft HRA	Grey seals are not a feature of the Wash and North Norfolk Coast SAC and Natural England therefore considers it is not necessary or appropriate to include them in the HRA for this designated site.	As agreed with Natural England at the 3rd ETG meeting on the 9th of January 2019, an assessment was completed on grey seal as part of The Wash and North Norfolk Coast SAC. However, due to this further advice provided by Natural England on the draft

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				HRA, this assessment has now been removed.
Natural England	Section 42 Consultation	Draft HRA	A description of what 'the Wash and Blakeney point count' is should be included in the text. It is currently referred to for the first time in table 5.49 and no explanation or context is provided anywhere in the text for either EA2 or EA1N.	Text has been added to ***section 5.4.1*** of this ***Information to Support the Appropriate Assessment report***.
Natural England	Section 42 Consultation	Draft HRA	Winterton-Horsey Dunes SAC does not have any marine mammal species listed as either a primary reason for selection of the site or as a qualifying feature and therefore Natural England consider it is not essential for the site to be included within an HRA for marine mammals.	As agreed with Natural England at the 3rd ETG meeting on the 9th of January 2019, an assessment was completed on grey seal as part of the Winterton to Horsey Coast SAC. However, due to this further advice provided by Natural England on the draft HRA, this assessment has now been removed.
Natural England	Section 42 Consultation	Draft HRA	Natural England welcomes the consideration of seals in the assessment of impacts from EA2 and EA1N, but considers impacts to seals at known haul out sites that are not part of a designated site should be included in the EIA, not HRA, section of the assessments.	As agreed with Natural England at the 3rd ETG meeting on the 9th of January 2019, an assessment was completed on grey seal as part of both The Wash and North Norfolk Coast and the Winterton to Horsey Coast SACs. However, due to this further advice provided by Natural England on the draft HRA, this assessment has now been removed. As assessment of disturbance to seal haul-out sites was scoped out the ES, however, the potential for disturbance and injury to

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				foraging grey seals has been included within the ***ES Chapter 11 Marine Mammals***, ***section 11.6***.
Natural England	Section 42 Consultation	Draft HRA	Paragraph 672 appears to have been lifted from the EA2 assessment and does not reflect the figures in table 5.44 of the EA1N assessment.	This text has been amended.
Natural England	Section 42 Consultation	Draft HRA	Natural England queries why the information in table 5.60 is only presented in the context of the in-combination reference population and not in the context of the Wash and Blakeney Point or the South-east MU as it is in table 5.60 of the EA2 assessment?	This table has been amended to include an assessment against both the Wash and Blakeney Point count and the South-East England Management Unit.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	Although we appreciate that developers are unlikely to construct more than one project at a time, it is possible that there may be some overlap between some project commencement and completion e.g. the construction and completion of Norfolk Vanguard and commencement of construction for Norfolk Boreas may overlap with East Anglia One North. This should be taken account within both the Environmental Statement and HRA assessment. When producing the final Environmental Statement and HRA, it will be important to consider any further information which may be available for Hornsea 4 and any potential offshore wind farm extensions.	Further information has been added to ***section 5.2.5.5.1*** to clarify that only piling impacts have been considered to not overlap for windfarms with the same developer. Other impacts have been considered for all windfarms with the potential to overlap in construction programmes, regardless of developer.

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The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	We recognise that the approach to HRA assessment for the Southern North Sea SAC is advancing and we are impressed by the level of assessment undertaken e.g. a spatial and seasonal assessment of all activities rather than just piling and UXO.	Acknowledged.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	TWT believe the assessment of the impact on abundance of harbour porpoise should be done against a site population. European guidance states “The expression ‘integrity of the site’ shows that the focus is here on the specific site. Thus, it is not allowed to destroy a site or part of it on the basis that the conservation status of the habitat types and species it hosts will anyway remain favourable within the European territory of the Member State .”4 Based on this guidance, to understand the impact on the integrity of the site, a site-based population assessment on the impact of development on the Southern North Sea SCI is required rather than assessing the impact in relation to the Management Unit. We suggest that a site-based population assessment should be considered against 17.5% of the SCANSIII population which would give an estimated population number of 29,384. Other offshore wind farm developers (Norfolk Vanguard) have undertaken an assessment against as estimated population number and included this as an appendix to the HRA assessment5. We would welcome this approach for East Anglia One North.	An assessment of impacts to the SNS SAC has been provided to the ETG to assess effects against the estimated site population. However, as stated within the Conservation Objectives for the site, it is not appropriate to use the SNS SAC site population in any assessments of effects of projects, as these need to take into account population estimates at the MU level, and therefore all assessments of effects on the SNS SAC are based on the North Sea MU (JNCC and Natural England 2019). This report was prepared and issued to the ETG for information only and was not part of the consultation on the draft HRA or PEIR.

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The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	Although we appreciate that underwater noise changes over distance, we are concerned that PTS impacts for pin piles using the SEL_{cum} ranges is up to 20km. We would welcome a conversation with the project team regarding this, including the need for further assessment and on the adequacy of mitigation.	The MMMP for both piling will be developed pre-construction in consultation, this will take into account the final project design, along with the latest guidance and latest information, including any updated noise modelling, to determine the predicted PTS ranges and mitigation required to reduce the risk of PTS in marine mammals. The assessments presented in the ES and draft MMMP are based on the current worst-case scenarios.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	We are pleased that an indicative figure for UXO clearances has been included and an assessment undertaken of impacts on the Southern North Sea SAC. However, we expect all offshore wind farm developers to undertake more pre-consent surveys to gain a realistic figure of required UXO clearances. This will ensure that a robust assessment of environmental impacts will be undertaken. With this information in place, a realistic dML could also be included within an application.	Further investigations into the number, location and size of UXOs within the East Anglia ONE North offshore development area will be undertaken in the pre-construction period.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	TWT is concerned that current mitigation used during UXO clearance is not fit for purpose. It is essential that work is undertaken over the coming years to gain realistic figures on noise impacts from UXO clearance and harbour porpoise response in relation to this. An assessment on the effectiveness of current mitigation measures, such as	Developing the MMMP for UXO clearance in the pre-construction period will allow for a detailed review and assessment of the most effective and appropriate mitigation methods at that time, based on the latest scientific evidence.

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			bubble curtains is also required. If the evidence suggests that current mitigation methods are not effective, then investment in research and deployment of new mitigation methods is required.	
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	For disturbance impacts, the HRA outlines that the spatial daily limits are likely to be exceeded if piling and UXO clearance took place concurrently. We welcome that that East Anglia One North will ensure that piling and UXO clearance will not occur concurrently or overlap to ensure no adverse effect on the site.	Acknowledged.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	Please note that TWT does not agree with the SNCB advice6 on underwater noise management for disturbance impacts. The proposed thresholds are not based on strong science and are therefore, not precautionary enough. TWT advocate the management approach used in Germany. However, we do support the use of the standard 26km deterrence radius.	Acknowledged.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	We have some concerns regarding the use of seasonal areas for underwater noise disturbance assessments. This approach will result in only half of the site being protected during half of the year. The current seasonal distribution of harbour porpoise may change over time due to natural factors or due to displacement from offshore wind farm development and therefore, it is essential that mitigation is deployed to ensure the protection of the whole site to safeguard site integrity. With the acknowledged gaps in	All mitigation included in order to negate effect of PTS within the MMMP for piling and UXO will be undertaken at all times of the year. The assessment on seasonal areas follows the most recent advice from the SNCBs. The development of the SIP will reduce any significant disturbance relative to the time of

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			understanding of harbour porpoise use of the Southern North Sea SCI, it would be consistent with the Precautionary Approach to deliver whole site mitigation.	year and area of SNS SAC that disturbance could occur within. An In principle SIP has been submitted with this DCO Application (document reference 8.17) and is secured under the requirements of the draft DCO.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	TWT agree that mitigation will be required to ensure no adverse effect upon site integrity from the in-combination impacts of underwater noise disturbance. The industry standard evolving appears to be the development and delivery of Site Integrity Plans (SIP) as the mechanism to ensure this. In principle, TWT support the use of SIP to manage the in-combination effect of underwater noise impacts from construction activity within the Southern North Sea SAC. However, with a lack of a mechanism to manage the multiple SIPs that will be in place to regulate in-combination impacts, no adverse effect on site integrity cannot currently be concluded. TWT believe that regulators need to develop a mechanism, such as a construction database, to ensure a robust assessment of in-combination impacts. This approach would create a mechanism to manage multiple construction schedules and would give more certainty that there will be no adverse effect upon the Southern North Sea SCI from in-combination impacts. A commitment by developers to contribute construction data must be	Acknowledged. The SIP will be developed in the pre-construction period, and will allow for a detailed review and assessment of the most effective and appropriate mitigation methods at that time, based on the latest scientific evidence to reduce underwater noise impacts across the SNS SAC, including the review of the best available mitigation techniques. An In principle SIP has been submitted with this DCO Application (document reference 8.17) and is secured under the requirements of the draft DCO. The mechanism by which the SIPs will be managed, monitored and reviewed is beyond the scope of the project.

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			conditioned.	
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	We look forward to engaging with East Anglia One North on the development of marine mammal monitoring. This is especially important for the Southern North Sea SAC. Although SCANS surveys may not suggest any change in harbour porpoise density since the mid-1990s, analysis suggests that there is low power to detect changes in populations from SCANS data and populations of marine mammals may reach critical levels before a decline is detected. TWT also suggests that a strategic approach to monitoring should be implemented within the SAC which would yield better results and be a better use of individual developer resources. We are aware that a mechanism to allow strategic monitoring does not exist and we would welcome a conversation with SPR on how this can be achieved.	Details of potential monitoring will be developed pre-construction. These will be developed in consultation with stakeholders and be appropriate to the final project design and construction methodology. High-level proposals for monitoring are included in the In principle Monitoring Plan (document reference 8.13), provision is also included (if required) within the In principle SIP (document reference 8.17).
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	TWT would like to highlight that a range of guidance is out of date as it was not developed with the scale of round 3 offshore wind farms in mind. This includes guidance for both piling and UXO activities. We believe JNCC were considering updating their advice in these areas.	Reference to the JNCC guidance (JNCC, 2010) has been provided for context only. Developing the MMMP for piling and UXO clearance in the pre-construction period will allow for a detailed review and assessment of the most effective and appropriate mitigation methods available at that time, including the latest scientific evidence and guidance.

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Eastern IFCA	Section 42 Consultation	Draft HRA	Southern North Sea candidate Special Area of Conservation (cSAC) The East Anglia ONE North project offshore development area is located wholly within the Southern North Sea cSAC, a European Marine Site (EMS) designated for the protection of Harbour porpoise under the Habitats Directive as transposed by the Conservation of Habitats and Species Regulations 2010 and the Offshore Marine Conservation Regulations 2007. EIFCA acknowledges that studies analyzing foraging rates in harbour porpoise have found that they feed almost continuously and are therefore highly sensitive to disturbance. EIFCA supports the use of mitigation measures to aim to remove marine mammals from the mitigation zone prior to the start of piling to reduce the risk of any physical or auditory injury.	Acknowledged.
Eastern IFCA	Section 42 Consultation	Draft HRA	The Wash and North Norfolk Coast Special Area of Conservation (SAC) The Wash and North Norfolk Coast SAC is located approximately 100km from the East Anglia ONE North wind farm site at the closest point and 94km from the cable corridor, however the site was assessed in the PEIR to take into account the movements and prey resources of Harbour and Grey seal along the east coast of England. Grey seal are not currently a qualifying feature of The Wash and North Norfolk Coast SAC, however, it is recognised that Blakeney Point (located within the SAC) is important for breeding,	Acknowledged.

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			moulting and haul-out sites. Therefore, consideration is given to grey seal as part of The Wash and North Norfolk Coast SAC. Eastern IFCA acknowledge that the Applicant has identified potential effects on fish species during works on both the offshore cable corridor and offshore array. Impacts can result from physical disturbance and temporary loss of seabed habitat; increased suspended sediment concentrations and sediment re-deposition; potential disturbance of foraging seals from underwater noise (that could lead to mortality, physical injury, auditory injury or behavioural responses); increased collision risk with vessels and potential changes in prey availability. Potential effects on fish species during operation and maintenance can result from permanent loss of habitat; introduction of hard substrate; operational noise; and electromagnetic fields (EMF). Eastern IFCA consider that despite the potential for disturbance to prey species of Harbour/Grey seal through operational works associated with the project, evidence provided in the PEIR stating that 'any effects on prey species are likely to be intermittent, temporary and highly localised, with potential for recovery following cessation of the disturbance activity. Any permanent loss or changes of prey habitat will typically represent a small percentage of the potential habitat in the surrounding area' supports that the project is unlikely to result in significant impacts on either species of seal. Therefore, eastern IFCA support the outcome of the assessment that there would be no adverse effect on the integrity of The Wash and North Norfolk Coast	

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			SAC in relation to the conservation objectives for Harbour and Grey seal arising from changes in prey resources.	
WDC	Section 42 Consultation	Draft HRA	WDC are pleased to see that Chapter 11 Marine Mammals of the PEIR recognises the importance of the EA2 and EA1N areas, and that EA1N is in both the winter area and year round area of the SNS SCI for harbour porpoise, and that EA2 is in the winter area. Due to its location in the SNS SCI, it is likely that the construction of both wind farms will impact the harbour porpoise population of the SNS SCI, both stand-alone and particularly in-combination. Therefore construction at any time of year will require proven mitigation methods to ensure there is no adverse impact on the population of harbour porpoise supported by the site.	The potential for impacts in both the summer and winter areas of the SNS SAC for East Anglia TWO have been fully considered within this Information to Support Appropriate Assessment report, due to the proximity of the project to the seasonal areas of the SNS SAC.
WDC	Section 42 Consultation	Draft HRA	One of our main concerns is that the assessment on the harbour porpoise population in the SNS SCI is based against the North Sea Management Unit. WDC acknowledges that this is following guidance from the SNCB's, and within the SNS SCI Site Selection Document, it states "because this estimate is from a one-month survey in a single year it cannot be considered as a specific population number for the site. It is therefore not appropriate to use site population estimates in any assessments of effects of plans or projects (i.e. Habitats regulation Assessments), as these need to take into consideration population estimates at the MU level, to account for daily and seasonal movements of the animals" (JNCC, 2017). WDC strongly disagree with this advice. The European	Assessments were conducted based on the current SNCB advice which states that effects within the SNS SAC should be assessed against the wider population. As outlined within the Conservation Objectives of the site (JNCC and Natural England 2019), it is not advised to use the SNS SAC site population estimate in any assessments of effects of plans or projects, as these need to take into consideration population estimates at the MU level (JNCC and Natural England 2019). An additional assessment was completed

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			Commission guidance on managing Natura 2000 sites also states that the integrity of the site (habitat and species) must be maintained (European Commission and Office for Official Publications of the European Communities, 2000).	and provided to the ETG based on the estimate that the SNS SAC could support 29,384 harbour porpoise (SCANS-III data for 17.5% of the UK North Sea MU) alongside the PEIR for information.
WDC	Section 42 Consultation	Draft HRA	Any assessment on the SNS SCI must take into account the draft Conservation Objectives provided in the SNS consultation documents - that the site integrity must be maintained and there is no adverse impact on the population of harbour porpoise at the site (JNCC, 2016). Site based protection cannot be met by assessing the whole North Sea population, but only by assessing the impacts for the number of individuals that are supported by the site (Rees et al., 2013).	Assessments were conducted based on the current SNCB advice and the Conservation Objectives for the site. As outlined in the Conservation Objectives of the site (JNCC and Natural England 2019), it is currently not advised to use the SNS SAC site population estimate in any assessments of effects of plans or projects, as these need to take into consideration population estimates at the MU level. As stated above, an additional assessment was completed and provided to the ETG attendees, based on the estimate that the SNS SAC could support 29,384 harbour porpoise . However, this will not be submitted with the DCO Application.
WDC	Section 42 Consultation	Draft HRA	The case law supports an approach which looks at both the site-level population and the favourable conservation status within the species natural range (see e.g. Commission v Spain C 404/09). Commission Guidance (Managing Natura 2000 sites: The provisions of Article 6 of the Habitats	Assessments were conducted based on the current SNCB advice and the Conservation Objectives for the site. As outlined in the Conservation Objectives of the site (JNCC and Natural England 2019), it is currently not

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			Directive 92/43/EEC", European Commission, 2000, ISBN 92-828-9048-1) states at 2.3.2 that while favourable conservation status for species is defined by reference to its "natural range", the assessment of favourable conservation status at site level "will always be necessary". For the purposes of appropriate assessment, the focus is on the impact of the plan or project on the integrity of the site (for example, where article 6(4) is engaged, the damage to the site must be precisely identified (see Commission v Greece C43/10 at 114)).	advised to use the SNS SAC site population estimate in any assessments of effects of plans or projects, as these need to take into consideration population estimates at the MU level. As stated above, an additional assessment was completed and provided to the ETG based on the estimate that the SNS SAC could support 29,384 harbour porpoise, for information alongside the PEIR.
WDC	Section 42 Consultation	Draft HRA	During EWG meetings, WDC has previously raised concerns with the SNCB advice in section 206 of Chapter 11 Marine Mammals that "Displacement of harbour porpoise should not exceed 20% of the seasonal component of the SNS cSAC/SCI at any one time and or on average exceed 10% of the seasonal component of the SNS cSAC/SCI over the duration of that season". We do recognise that this is the current advice given by SNCBs and this is the guidelines that developers have to work within. However this threshold approach proposed by the SNCBs has not been agreed with the competent authorities and has not been consulted upon and we have serious concerns about the evidence base of these thresholds. Additionally these thresholds are based on the ASCOBANS 1.7% bycatch threshold for harbour porpoise population decline. We do not agree that this is appropriate as these are thresholds set for bycatch using the North Sea Management Unit harbour	This is the current SNCB advice for assessments on the SNS SAC and is therefore used in the assessments. However, it should be noted that in addition to the area based approach, assessments were also conducted on the harbour porpoise North Sea MU population. Additional assessments on the estimated number of harbour porpoise that the SNS SAC site could support being provided to the ETG alongside the PEIR

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			porpoise population as a baseline.	
WDC	Section 42 Consultation	Draft HRA	WDC welcome the additional harbour porpoise impact assessment 'Additional Southern North Sea candidate Special Area of Conservation / Site of Community Interest Assessment' for both EA2 and EA1N as discussed and agreed during the EWG meeting. We are pleased that that these documents undertake an additional assessment of the impacts of the developments upon on the estimated number of harbour porpoise that the SNS SCI site could support. We agree with the approach of estimating the number of harbour porpoise the site could support, as laid out in section 1.2 of the above document. The results of this assessment estimate that a significant area of the SNS SCI, and the harbour porpoise population supported by the site could be impacted by construction activities, particularly piling during construction when the data is extrapolated for 75 foundations required for EA2, and 67 for EA1N. As detailed below, pile driving during construction has been demonstrated to cause behavioural changes in harbour porpoises, and reduce abundance in the area during the entire construction window, and beyond (see section below on Potential Impacts).	Acknowledged. The MMMP and Site Integrity Plan SIP for the SNS SAC will reduce the potential impacts of piling and UXO clearance on harbour porpoise in the SNS SAC. A draft MMMP and In principle SIP has been submitted with this DCO Application (document references 8.14 & 8.17 respectively) and is secured under the requirements of the draft DCO .

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WDC		Section 42 comments on PEI	We recognise that the assessment has been undertaken with no mitigation measures applied and agree that this is the best approach and will give the most reliable results. We welcome the commitment to using mitigation methods to reduce the risk of piling activities on harbour porpoise and the SNS SCI. We also acknowledge that the full details of mitigation to be used are yet to be finalised in the Marine Mammal Mitigation Protocols (MMMP) for both UXO clearance and piling, alongside the Site Integrity Plan (SIP), and will set out the approach to deliver any project mitigation or management measures in relation to the SNS SCI. However, we have concerns over the embedded mitigation measures proposed and would like to see a commitment to using proven mitigation methods (see section below on Mitigation Methods). Until the details of the MMMPs and SIP are finalised, it is impossible to conclude that there will be no Adverse Effect on Integrity (AEoI) on the SNS SCI.	Developing the MMMP and SIP in the pre-construction period will allow for a detailed review and assessment of the most effective and appropriate mitigation methods at that time, based on the latest scientific evidence to reduce underwater noise impacts, including embedded mitigation. A draft MMMP (document reference 8.14) and In principle SIP (document reference 8.17) are submitted as part of this DCO application.
WDC	Section 42 Consultation	Draft HRA	We are concerned with the approach for the cumulative impact assessment (CIA) in section 1.6.1. We do not agree with the rationale behind the approach, the purpose of this additional assessment is to assess the impacts of EA2 and EA1N on the population of the SNS SCI. By undertaking the cumulative assessment against the North Sea Management Unit population instead it goes against the objective of this additional assessment, and results in misleading data that will under-represent the in-combination impacts on the SNS	The CIA included within the additional SNS SAC assessment, provided with the PEIR, assessed the potential for cumulative impacts as a result of other projects within the SNS SAC against the SNS SAC population, as well as the North Sea MU. If it is assumed that projects outwith the SNS SAC boundary (plus 26km or 10km where relevant) could impact harbour porpoise of

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			SCI. We recommend that the cumulative impact assessment is revisited, using projects and plans outside the boundary that could have an in-combination effect with EA2 or EA1N against the SNS SCI reference population that has been used in the rest of this assessment. That is the only way to ensure the cumulative impacts on the SNS SCI are adequately assessed. We agree with the other offshore wind farms that have been included in the CIA, however activities other than offshore wind farm construction within the SNS SCI, do not seem to be included e.g. oil and gas, marine aggregates etc.	the site, then it must also be assumed that harbour porpoise not within that boundary would be affected by those same projects, and therefore the North Sea MU population would be the most appropriate reference population to assess against, as has been done in the ES Chapter. For this reason, only those projects within the SNS SAC boundary (or within 10km or 26km of the boundary) have the potential to affect those harbour porpoise that are within the site at that time. Other activities (such as oil and gas and marine aggregates) have been screened out of cumulative assessment, as stated within ***Appendix 11.3.***
WDC	Section 42 Consultation	Draft HRA	Due to the location of EA2 and EA1N in the winter area, and year round area of the SNS SCI, it is particularly important that only proven mitigation measures are used as this is the only way to ensure no AEoI on the harbour porpoise population of the site. WDC would like to see a commitment to using mitigation methods that have been proven in both test scale (Diederichs et al., 2013; Wilke et al., 2012) and full-scale sites, in particular bubble curtains (Brandt et al., 2018; Dähne et al., 2017; Nehls et al., 2016).	Developing the MMMP for both piling and UXO clearance in the pre-construction period will allow for a detailed review and assessment of the most effective, and appropriate mitigation methods at that time, including considerations into those mitigation measures that have previously been proven to be effective.

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The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	We recognise that the approach to HRA assessment for the Southern North Sea SAC is advancing and we are impressed by the level of assessment undertaken e.g. a spatial and seasonal assessment of all activities rather than just piling and UXO.	Acknowledged.
The Wildlife Trusts / Suffolk Wildlife Trust	Section 42 Consultation	Draft HRA	For disturbance impacts, the HRA outlines that the spatial daily limits are likely to be exceeded if piling and UXO clearance took place concurrently. We welcome that that East Anglia One North will ensure that piling and UXO clearance will not occur concurrently or overlap to ensure no adverse effect on the site.	As discussed at the ETG on 21st June 2019 the scenarios allow for UXO clearance and piling concurrently. While this is highly unlikely to occur concurrently between the East Anglia TWO and East Anglia ONE North projects, the assessment has allowed for this scenario.
Natural England	ETG Meeting 1: 22 May 2017	Draft HRA	The species to be considered for potential connectivity with the EA1N site, of grey seal, harbour seal, harbour porpoise and bottlenose dolphin is agreed.	Acknowledged.
Natural England	ETG Meeting 1: 22 May 2017	Draft HRA	Approach to the assessment of effects on the Southern North Sea SAC on the basis of the Conservation Objectives of the site, the harbour porpoise North Sea MU reference population, the estimated SAC population, the winter and summer areas of the site and the overall site area is agreed.	Acknowledged. It is noted that the approach to the assessment of effects on the Southern North Sea SAC is subject to review in line with future changes to the Advice on Activities and Conservation Objectives of the site.
Natural England	ETG Meeting 4: 21 June 2019	Draft HRA	The approach to the assessment of effects for the Southern North Sea SAC to be based on the North Sea MU rather than the site population is agreed. As is the approach that the assessment against the site population will not be submitted as part of the DCO.	Acknowledged. It is noted that a similar assessment may be required as part of the examination process, but similar assessments completed as part of the Norfolk Vanguard and Norfolk Boreas

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				projects could be referred to.
Natural England	ETG Meeting 4: 21 June 2019	Draft HRA	The approach to using the mean annual density within the assessments of effect for the Southern North Sea SAC, rather than the seasonal density for the winter and summer area, is agreed.	The mean annual densities are used to allow for the known seasonal variation in the density of harbour porpoise in the site, and to put into the context of the North Sea MU.
Natural England and MMO	ETG Meeting 4: 21 June 2019	Draft HRA	The MMMPs and SIPs for both piling and UXO will be developed in consultation with the MMO, SNCBs and TWT and WDC. However, final agreement on the MMMPs and SIPs will only be sought from the MMO and SNCBs, with TWT and WDC providing comment only.	Acknowledged.

References

Scottish Power Renewables (2017). East Anglia ONE North Offshore Windfarm Scoping Report. November 2017.

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