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THE INFRASTRUCTURE PLANNING (ENVIRONMENTAL PROCEDURE RULES)
2010

HORNSEA OFFSHORE WIND FARM PROJECT TWO

**WRITTEN SUBMISSION FOR DEADLINE 3:
APPENDIX 3**

24th September 2015

HRA Collision and displacement Impacts for gannet on Flamborough and Filey Coast pSPA (FFC pSPA).

This note sets out Natural England’s position on the collision and displacement risk posed to gannet at the Flamborough and Filey coast (FFC) pSPA. Our analysis draws on data provided by the Applicant on gannet in support of their submissions for Hornsea Project 2.

Table 1. Natural England conclusions on predicted mortality for gannet from the FFC pSPA, from Hornsea Project Two alone and in-combination with other plans and projects.

PROJECT ALONE	Predicted collisions Basic Band Model Option 2. AR 98.9%¹. Adult bird mortalities².		
	Lower CL	Mean	Upper CL
	6	17	37
	Predicted displacement using mean species densities. Adult bird mortalities.		
	Lower Displacement (30% displacement, 1% mortality)		Upper Displacement (70% displacement, 10% mortality)
	1		20
Likely impact considered by Natural England	For the purposes of assessing colony impacts against the outputs of the population models Natural England has focussed our assessment of the project alone on the mean estimate of 17 adults per annum from collision mortality with an additional mortality from displacement of up to 20 adult birds (Table 2), which combined gives a predicted mortality of up to 37 adult birds per annum . Natural England do not consider this range of potential mortality to be precautionary as it does not factor in additional uncertainty around the		

¹ Figures are based on use of Basic Band Model Option 2. AR 98.9% following SNCB (2014) guidance. Joint Nature Conservation Committee (JNCC), Natural England (NE), Natural Resource Wales (NRW), Northern Ireland Environment Agency (NIEA), Scottish Natural Heritage (SNH). (2014). Joint Response from the Statutory Nature Conservation Bodies to the Marine Scotland Science Avoidance Rate Review. 25th November 2014.

² Based on April-August 72%, Sept-Nov 4.8% and Dec-March 6.2% of collisions apportioned to FFC pSPA. All figures relate to adult birds. Breeding season apportioning based on the proportion of adults recorded on baseline surveys of Hornsea P2, non-breeding season apportioning based on percentages derived from Furness (2015).

	<p>densities of birds in the project area which affects both collision and displacement predictions, and for collisions, variability around avoidance rates (AR) and flight height data, incorporation of which could increase the range of potential mortalities. Factoring in variability in the baseline density estimates for birds in flight, Natural England considers that potential collisions are in the range 6 to 37 adults per annum based on predicted collisions for the upper and lower 95% confidence limits of the gannet density data for the project area³. Similarly, accounting for the upper and lower 95% confidence limits of the baseline density data for the displacement assessment gives a range of 0-53 birds additional mortality based on displacement rates 30-70% and associated mortality 1-10%, which combined with the collision figures could result in an impact of up to 90 adults per annum.</p>
<p>Conclusions on AEOI for FFC pSPA for Project alone impacts</p>	<p>A density independent PVA model⁴ predicts that with an additional annual adult mortality of 50 birds (closest modelled output to predicted adult impact of 17 adults from collision and up to 20 adults from displacement) the population growth rate would fall by 0.21% and the population size at 25 years would be 5.1% lower than the un-impacted population size. Considering a range of impacts up to 100 adults per annum (closest modelled outputs to the 90 bird upper impact value considered) that factors in variability around numbers of birds in the Project area, the growth rate would fall by up to 0.45% and the final population size would be up to 10% lower than the un-impacted population size at 25 years. A density dependent model would predict smaller declines in growth rate, however there is no clear evidence to support application of any particular form or magnitude of density dependence in the modelling.</p> <p>The density independent PVA model⁵ predicts that the population will grow at 1.79% per annum over the next 25 years. The Bempton Cliffs colony has been increasing since the 1980s but more steeply since 2004. The colony grew at 10.5% per annum 1986-2012, or 12.8% per annum 2004-2012⁶. The UK population</p>

³ Confidence limits around densities are the 95% CL presented in Appendix J, Deadline I.

⁴ SMartWind (2015). Appendix M - MacArthur Green Seabird PVA Report. Submitted Deadline 2a. Outputs from density independent model and demographic rate set 2 used.

⁵ Natural England have based our assessment on the Applicant's Density independent model with GX2 demographic rate set.

⁶ From Seabird Monitoring Programme (SMP) Online Database. Accessed 01 Sept 2015. <http://jncc.defra.gov.uk/smp/Default.aspx>

	<p>increased by 39% between 1984/85 and 2004/05 which equates to an increase of 2% per annum⁷. The FFC pSPA gannet colony has grown at a greater rate than many other UK colonies over this time period. In particular larger colonies have increased at a slower rate e.g. Bass Rock (~75k pairs) grew at 4.6% per annum 2004-2014 and the colony at St Kilda (~60k pairs) has remained relatively stable. While the current rate of increase at FFC pSPA may not be maintained for the next 25 years, there is potential for continued colony growth in the short-term at least due to high productivity rates at the colony and the large number of non-breeding immatures associated with the colony⁸</p> <p>The population for FFC pSPA is given as 8,469 pairs based on counts from 2008-2012⁹ and the latest count for the colony was 11,061 pairs in 2012. When the conservation objectives are set for the FFC SPA there is likely to be a maintain objective for the gannet feature.</p> <p>Natural England consider that predicted mortalities for the project alone will not exceed a level whereby the growth rate of the population would be reduced by 0.45% per annum. On the basis of an objective to maintain the population at or around current levels and against a current colony growth rate of 12.8% and some evidence that the colony will continue to grow, the predicted level of impact is considered no AEoSI.</p>
IN-COMBINATION	<p style="text-align: center;">Predicted Adult Mortalities. Basic Band Model. Option 1/Option 2. AR 98.9%.</p> <p style="text-align: center;">190</p>
Likely impact considered by NE	<p>Natural England has based our assessment of impacts on an in-combination estimate of 190 adults additional mortality per annum. Natural England's position is based on Basic Band Model Option 1 outputs unless Option 2 was specifically agreed for a project during its examination. Breeding season apportioning</p>

⁷ JNCC (2014). Seabird Population Trends and Causes of Change: 1986-2013 Report (<http://www.jncc.defra.gov.uk/page-3201>). Joint Nature Conservation Committee. Updated July 2013. Accessed 01 Sept 2015.

⁸ JNCC (2014). Seabird Population Trends and Causes of Change: 1986-2013 Report (<http://www.jncc.defra.gov.uk/page-3201>). Joint Nature Conservation Committee. Updated July 2013. Accessed 01 Sept 2015.

⁹ <http://webarchive.nationalarchives.gov.uk/20140605090108/http://www.naturalengland.org.uk/ourwork/conservation/designations/spa/flamborough-fileypspaconsultation.aspx>

follows the Applicant's method. Non-breeding season apportioning was calculated as per Furness (2015), (see footnote 2) which results in slightly lower apportioning to FFC pSPA compared to the Applicant.

Natural England has used a 45% reduction in collisions for MORL rather than the Applicant's 55.4% reduction based on consent granted for 186 rather than the Rochdale Envelope 339 turbines¹⁰, and have used the Option 1 figures for East Anglia One rather than Option 2 as the former were used in the assessment for the project.

Natural England included collisions from projects in the English Channel in the assessment as these are within the North Sea and Channel BDMPS for gannet in the non-breeding season, noting that inclusion of Navitus OWF only adds 1 predicted collision to the total.

Natural England do not consider 190 birds to be a precautionary assessment of potential in-combination impacts as it does not account for impacts on the 30% of gannet originating from the FFC pSPA colony that are predicted to be in Western Waters (which includes the Irish Sea) in the spring migration period (Furness 2015), and does not account for additional mortality arising from displacement (Table 2) or uncertainty around baseline densities of birds in project areas, flight height variability and AR variability.

Additionally the Applicant has reduced the number of collisions for East Anglia One and MORL on the basis of the consent for these projects being given for fewer turbines than modelled in the original assessments. However, it is not proven that collisions will be reduced by the same percentage as turbine number reductions as generating capacities are not reduced by same amount and therefore turbine parameters will not be the same. Natural England is unclear at present whether the updated collision risk calculations have been made available to allow verification that the 26% reduction in the number of turbines at East Anglia One or 45% (55.4% assumed by Applicant) reductions for MORL would result in the same percentage reduction in

¹⁰ Telford, Stevenson, MacColl Wind Farms and Associated Transmission Infrastructure Environmental Statement Additional Information: Ornithology Population Viability Analysis Outputs and Review. 2013.

	<p>predicted collisions.</p> <p>Further the in-combination assessment does not include any predicted mortalities from the East Anglia Three.</p>
<p>Conclusions on AEO SI for FFC pSPA for Project in-combination impacts</p>	<p>A density independent PVA model predicts that with an additional annual adult mortality of 200 birds (closest modelled outputs to predicted 190 bird impact) the population growth rate would fall by 0.91% and the population size at 25 years would be 19% lower than an un-impacted population size.</p> <p>The PVA model predicts growth of 1.79% per annum and a reduction in growth rate of close to 1% would be considered significant against this. However the growth rate predicted by the PVA model is not a good fit to the observed trend at the colony which is growing at 12.8% per annum. One explanation for this discrepancy is that the higher growth rates observed are being driven by immigration from other colonies. If the colony were to continue to grow at 12.8% per annum, a 0.91% reduction in population growth rate would not be counter to a conservation objective to maintain the population.</p> <p>While the colony is not predicted to maintain this growth rate indefinitely, there is currently no evidence that the colony will not continue to grow at a rate significantly higher than that predicted by the PVA model. Further, productivity rates at the colony remain high and during the 2009 colony count there were 1,470 non-breeding immatures counted in “club” areas of the colony suggesting capacity for further colony growth¹¹. On the basis that the colony is predicted to grow at a rate considerably higher than the 1.79% per annum predicted by the PVA model Natural England can conclude No AEO SI for an additional mortality of 190 adults.</p>

¹¹ JNCC (2014). Seabird Population Trends and Causes of Change: 1986-2013 Report (<http://www.jncc.defra.gov.uk/page-3201>). Joint Nature Conservation Committee. Updated July 2013. Accessed 01 Sept 2015.

Table 2. Displacement impacts for gannet apportioned to FFC pSPA. Based on mean population estimate for site. Predicted mortalities are adult birds.

GX mortality figures		% Mortality			
FFC adults mean of pop ests		1	2	5	10
% Displacement	30	1	2	4	9
	40	1	2	6	11
	50	1	3	7	14
	60	2	3	9	17
	70	2	4	10	20