



THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION  
PROCEDURE) RULES 2010

HORNSEA OFFSHORE WIND FARM - PROJECT TWO  
APPLICATION

International Mainstream Renewable Power Limited and Siemens  
Project Ventures for:

The construction and operation of Hornsea Offshore Wind Farm Project Two, a 1,800 MW with up to 360 turbines wind farm located approximately 89km off the East Riding of Yorkshire coast, and 50km from the median line between UK and Dutch waters.

Planning Inspectorate Reference: EN010053

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**WRITTEN SUBMISSION FOR DEADLINE 4**

Dated 20<sup>th</sup> October 2015

## **INTRODUCTION**

1.1 This submission consists of 4 parts:

- a. Section A– Natural England’s response to the Examining Authority’s second round of written questions
- b. Section B – Natural England’s detailed response to the Examining Authority’s written question EOO16
- c. Section C – Natural England’s detailed response to the Examining Authority’s written question EOO19
- d. Section D - References

**SECTION A – Natural England’s response to the Examining Authority’s second round of written questions**

	Question to:	Question:	Natural England Response:
EOO	<b>Ecology offshore: ornithology</b>		
EOO15	applicant, NE	Please provide an update on the position reached on the Ornithology Road Map, including the Clarification Notes, as mapped out in Appendix Y to Deadline 3.	<p>Since the submission of its response at Deadline 3 Natural England has continued to engage with the Applicant to resolve outstanding matters wherever possible.</p> <p>As set out in their Deadline 3 Offshore Ornithology Roadmap, the Applicant intends to submit various documents at Deadline 4. Natural England will review the respective Clarification Notes and will provide an update at Deadline 5 and, where possible, at the issue specific hearings (scheduled for 27<sup>th</sup> October 2015).</p>
EOO16	applicant, NE, RSPB	<p>Please provide an update on the positions reached in the most recent SoCG on the effects of Hornsea Project 2 on Special Protection Areas (SPA) populations of kittiwake, gannet, guillemot, razorbill and puffin, for the project alone and in combination. Relevant data should be presented in tabular form.</p> <p>This should include in particular the issues around kittiwake, including Flamborough Head Bempton Cliff and Flamborough and Filey Coast (FHBC/FFC) population trends, and additional clarification on kittiwake apportioning.</p>	<p>Natural England provided details in our submission at Deadline 3 (Appendices 2-7), in tabular form, of its position on the effects of Hornsea Project 2 on Special Protection Area (SPA) populations of kittiwake, gannet, guillemot, razorbill and puffin, for the project alone and in combination. Please note that Natural England continues to discuss the predicted impacts of the project on kittiwake with the applicant, and an update on progress will be provided at the Issue Specific Hearings.</p> <p>Information on kittiwake population trends and apportioning for Flamborough Head and Bempton Cliffs SPA and Flamborough and Filey Coast pSPA is set out in detail in Section B of this submission.</p>

Question to:	Question:	Natural England Response:
EOO17	applicant, NE, RSPB	<p>Please provide an update on the positions reached in SoCG on the effects of Hornsea Project 2 on EIA species (including lesser black backed gull, and greater black backed gull). Relevant data should be presented in tabular form.</p>
EOO18	applicant, NE	<p>Please provide an update on discussions between the applicant and NE on migratory bird collision risk.</p>
EOO19	applicant, NE and RSPB	<p>Given the paucity of recent data on Offshore Windfarm (OWF) ornithological impacts, and the importance noted in NPS EN-3 of improving the evidence base, can the applicant please:</p> <p>a) set out the Project approach to the monitoring of offshore ornithological impacts (not limited to the pre- and post- construction surveys); and</p>

Natural England met with the applicant on 14 October 2015 to discuss the EIA positions for the relevant species including lesser black-backed gull and great black-backed gull. Natural England understands that the applicant will submit updated EIA tables at Deadline 4. Natural England will provide an update on any positions reached for EIA species including lesser black-backed gull and great black-backed gull at Deadline 5.

Natural England met with the applicant on 14 October 2015 to discuss the migratory collision risk assessment for seabirds. Natural England understands that the Applicant will submit an updated migratory bird collision risk assessment for the 5 seabird species (great skua, Arctic skua, little gull, Arctic tern and common tern) at Deadline 4. Natural England will provide an update on any positions reached at Deadline 5.

Although this question is directed to Natural England, along with the Applicant and RSPB, we think the Applicant is better placed to respond.

Natural England understands that conditions 10(2)(k) and 15(2)(b) in the DMLs commits the Applicant to undertake monitoring in accordance with the Ornithological Monitoring Plan (OMP), details of which will be decided post consent.

However, the OMP condition should be read in conjunction with the In-Principle monitoring Plan (IPMP) which sets out the key

<b>Question to:</b>	<b>Question:</b>	<b>Natural England Response:</b>
	b) indicate where the approach will be secured in the DCO/DMLs.	species which should be monitored and what approaches could be adopted (e.g. site specific, colony specific or strategic).
EOO20	NE, MMO and RSPB Further to the submission of 'Notes of NE/RCUK Post Consent Monitoring Seminar (March 2015)' to Deadline 3 (REP3-032), can NE, MMO and RSPB please advise on potential good practice for project specific, and strategic, ornithological impacts monitoring?	Natural England's response to question EOO20 is set out in Section C of this submission.
<b>EOMM</b>	<b>Ecology offshore: marine mammals</b>	
EOMM2 7	NE What is the basis in international law for extending the Wash pSPA beyond the limit of the territorial sea?	Natural England understands that this question is in relation to the draft Greater Wash SPA, in which the current draft boundary extends beyond the UK's territorial sea limit (i.e. beyond the 12nm limit).  Natural England's remit as regards to the designation of European sites does not extend beyond 12nm (at 12nm JNCC becomes the relevant SNCB). Information on how the requirements of the Birds and Habitats Regulations are applied beyond territorial waters can be found on the JNCC website at: <a href="http://jncc.defra.gov.uk/page-4550">http://jncc.defra.gov.uk/page-4550</a> . If further detail is required, Natural England recommends that the Examining Authority contact John Clorley (Head of MPA Management and International Marine Biodiversity Team) at Defra.
<b>EL</b>	<b>Ecology – onshore and intertidal</b>	

	<b>Question to:</b>	<b>Question:</b>	<b>Natural England Response:</b>
EL21	applicant, NE	<p>Please provide in tabular form the NE/applicant conclusions about the effects of Hornsea Project 2, (i) alone and (ii) in combination, on features of:</p> <p>a) the Humber Estuary SPA;</p> <p>b) the Humber Estuary Ramsar site; and</p> <p>c) the Humber Estuary SAC.</p>	<p>Please refer to the Applicant's response to question EL21, which is effectively a joint statement regarding our positions on the effects of the project, alone and in-combination, on the features of the Humber Estuary SAC, SPA and Ramsar site.</p>
<b>CL</b>	<b>Construction – onshore and inter-tidal</b>		
CL25	applicant, NE, RSPB	<p>With regard to the Intertidal Access Management Plan, please advise on:</p> <p>a) progress made; and</p> <p>b) how the plan is secured?</p>	<p>Natural England welcomes the Applicant's commitment to prepare and submit an Intertidal Access Management (IAMP) post consent that will be agreed with the relevant local authorities and Natural England. The plan will set out specific details in relation to access over the lifetime of the project (i.e. during construction and operational phase of the project) to ensure impacts are no greater than those assessed in the environmental Statement.</p> <p>Natural England looks forward to seeing an updated version of the draft DCO/DMLs incorporating the requirement for an IAMP.</p>
CL26	RSPB, NE	<p>Are the RSPB and NE satisfied with the scope of contents of the Code of Construction Practice (CoCP), including how</p>	<p>Natural England is satisfied with the scope of contents of the CoCP. We understand that the CoCP sets out the management measures that will be required for all of Hornsea Project Two</p>

<b>Question to:</b>	<b>Question:</b>	<b>Natural England Response:</b>
	the role of the Ecological Clerk of Works (ECOW) is secured?	<p>construction activities and will incorporate a suite of documents/plans, some of which will be required to be produced and agreed with Natural England (e.g. EMP, Construction Method Statement, etc.).</p> <p>Natural England understands that all ecology works described in the CoCP will be carried out under the guidance of ECoW. The role of the ECoW will be set out in the EMP and Project Environmental Management and Monitoring Plan (PEMMP).</p>
<b>CS</b>	<b>Construction – offshore</b>	
CS17	applicant, MMO and NE	<p>Please provide an update on the progress between the applicant and the MMO/NE in resolving issues relating to the 'In Principle Monitoring Plan', including inclusion in the draft DCO.</p> <p>The inclusion of the IPMP in the draft DCO is still a matter of on-going discussion between Natural England and the Applicant. Natural England maintains its position that the IPMP is an important document and would welcome its inclusion in the DCO.</p>
<b>DC</b>	<b>Draft Development Consent Order (DCO)</b>	
DC31	MMO	<p>Is the MMO now satisfied with the latest version of the DMLs? If not, what further amendments do they require?</p> <p>Although this question is not directed at Natural England, we have provided some comments below to aid the Examiners' understanding of outstanding concerns that we believe need to be addressed in the draft DCO/DMLs.</p> <p>In our written representation (para 6.6.36) Natural England raised concerns of potential disturbance to overwintering birds due to scheduled inspections during the operational and maintenance phase of the project. During a meeting on 15<sup>th</sup></p>

Question to:	Question:	Natural England Response:
		<p>October the Applicant has advised they will update the draft DMLs with an overwintering restriction during the operation &amp; maintenance phase of the project, the text of which has been agreed with Natural England.</p> <p>The inclusion of a 6.5m CD tidal restriction on construction activities taking place in the intertidal area is still a matter of discussion between the Applicant and Natural England.</p>
DC33	NE, MMO and local authorities	<p>a) Do NE, MMO and the local authorities consider that they have sufficient information on the principles and parameters to be used in drafting the Ecological Management Plan (EMP) to be confident that the submitted plan will be capable of approval?</p> <p>b) Do they consider that they have or will have sufficient information and assurances about monitoring to be confident that the submitted EMP will be monitored adequately?</p> <p>c) Do they consider that they will have sufficient information to be confident about the enforcement of the EMP?</p> <p>a) Natural England is satisfied that the outline EMP submitted by the Applicant has considered the appropriate habitats and species of nature conservation importance. Additionally, Natural England notes that the EMP will be submitted for approval by the local authorities in consultation with Natural England, at least 4 months prior to commencement of construction activities.</p> <p>b) Natural England notes that monitoring will be conducted in accordance with Natural England's licensing guidelines, where appropriate. In addition we note that the scope of monitoring surveys (e.g. intertidal habitats, sand dunes and <i>Salicornia</i> and other annuals colonising mud) will be produced and agreed with Natural England. Therefore, Natural England is satisfied that the EMP will ensure adequate pre, and post, construction monitoring is carried out.</p> <p>However, we have highlighted with the Applicant that a requirement to secure intertidal monitoring for operational and maintenance activities over the lifetime of the project is needed. The Applicant has identified that the In-Principle Monitoring Plan</p>

Question to:	Question:	Natural England Response:
		<p>relates to the DML activities only, so it wouldn't be an appropriate place to secure such a requirement, but noted the EMP could consider this. Therefore, Natural England welcomes further discussions with the Applicant on how intertidal monitoring over the lifetime of the project can be secured as part of the consenting process, recognising the detail of monitoring would be included in either the EMP, IAMP or IPMP and dealt with post consent/prior to construction as required.</p> <p>c) Enforcement of DCO/ DML conditions is a matter for the consideration of the regulators i.e. MMO and Local Authorities</p>
DC34	NE, MMO and local authorities	<p>a) Do NE, MMO and the local authorities consider that they have sufficient information on the principles and parameters to be used in drafting the CoCP to be confident that the submitted code will be capable of approval?</p> <p>b) Do they consider that they have or will have sufficient information and assurances about monitoring to be confident that the submitted CoCP will be monitored adequately?</p> <p>c) Do they consider that they will have sufficient information to be confident</p> <p>a) Natural England does not have any outstanding concerns regarding the CoCP. We understand that the CoCP sets out the management measures that will be required for all of Hornsea Project Two construction activities and will incorporate a suite of documents/plans, some of which will be required to be produced and agreed with Natural England (e.g. EMP, Construction Method Statement, etc.).</p> <p>b) Natural England is satisfied that the pre-construction plans, surveys and documentation that will be incorporated into the CoCP will ensure adequate monitoring will be carried out. In addition, these will plans and documents will be produced and agreed with Natural England.</p> <p>c) Enforcement of DCO/ DML conditions is a matter for the</p>

Question to:	Question:	Question:	Natural England Response:
		about the enforcement of the CoCP?	consideration of the regulators i.e. MMO and Local Authorities

## **SECTION B – Natural England’s detailed response to the Examining Authority’s written question EOO16**

**EOO16: Please provide an update on the positions reached in the most recent SoCG on the effects of Hornsea Project 2 on Special Protection Areas (SPA) populations of kittiwake, gannet, guillemot, razorbill and puffin, for the project alone and in combination. Relevant data should be presented in tabular form. This should include in particular the issues around kittiwake, including Flamborough Head Bempton Cliff and Flamborough and Filey Coast (FHBC/FFC) population trends, and additional clarification on kittiwake apportioning.**

Natural England provided details in our submission at Deadline 3 (Appendices 2-7), in tabular form, of its position on the effects of Hornsea Project 2 on Special Protection Area (SPA) populations of kittiwake, gannet, guillemot, razorbill and puffin, for the project alone and in combination. Please note that Natural England continues to discuss the predicted impacts of the project on kittiwake with the applicant, and an update on progress will be provided at the Issue Specific Hearings.

Below, Natural England provides information on kittiwake population trends for Flamborough Head and Bempton Cliffs SPA and Flamborough and Filey Coast pSPA in the context of national and regional trends based on data from JNCC (2014), as well as clarification of kittiwake apportioning.

### **Kittiwake Population Trends**

#### **Information from UK Seabird Population Censuses: 1969-2002.**

Three complete censuses of seabirds at their breeding colonies in Britain and Ireland have been carried out: Operation Seafarer (1969-70); the Seabird Colony Register (SCR) Census (1985-1988); and Seabird 2000 (1998-2002). These censuses of colonies across Britain and Ireland allow calculation of population change between the census periods as a percentage change in breeding numbers (Table 1).

**Table 1. Population changes in kittiwake numbers (Apparently Occupied Nests (AON)) at a UK, England and Scotland scale between the national census periods.**

	Population change 1969-70 – 1985-88 (between Operation Seafarer and SCR)	Population change 1985-88 – 1998-2002 (between SCR and Seabird 2000)
Kittiwake UK scale	+24%	-25%
Kittiwake England Scale	+153%	-39%
Kittiwake Scotland Scale	+4%	-21%
Kittiwake Wales Scale	+27%	-20%

The overall UK trend was an increase in numbers between 1969/70 and 1985-88, followed by a decline between 1985-88 and 1998-2002. The percentage population increase between 1969/70 to 1985-88 was greatest in England although this does reflect the starting population being much lower in England than in Scotland. The kittiwake population in England in 1969/70 was 49,676 AON, compared to 346,097 AON in Scotland (and 6,891 AON in Wales). While the largest increase in numbers between 1969/70 and 1985-88 was in England, there were also substantial increases at a number of Scottish colonies, particularly in the south-east of Scotland, and similarly increases in kittiwake numbers at English sites occurred not only in Humberside (where Bempton Cliffs and Flamborough Head SPA colony

is located) but also at colonies in Northumberland, Cleveland and North Yorkshire (Mitchell et al. 2004).

The percentage change in breeding numbers between censuses can also be calculated for individual colonies. Table 2 below shows population changes for the most important kittiwake colonies in Britain in the period between the two most recent seabird censuses. This shows that the majority of large kittiwake colonies in Britain experienced declines over the period 1985/88 – 1998/2002, including the Bempton Cliffs (including North Flamborough Head) colony. The average population change over this period for the major colonies was a decline of 21% or a 2.35% decline per annum. Individual colonies show per annum rates for change that varied from an 8.2% per annum decline to a 4.5% per annum increase. The Bempton Cliffs (including North Flamborough Head) colony covers kittiwake that are within the original Flamborough Head and Bempton Cliffs SPA. This site supports one of the largest kittiwake colonies in the UK and the only colony that qualifies as an SPA for kittiwake as a feature in England. Between the two census periods the population declined by 50%, which equates to a 5.2% decline per annum.

**Table 2. Changes in the number of breeding kittiwakes (AON) at major colonies in Britain between the SCR Census (1985–88) and Seabird 2000 (1998–2002). Major colonies are those that contained the top 50% of the national populations of Great Britain during the SCR Census. Pink shading indicates colonies where numbers have declined, green shading colonies that have shown increases between the two census periods. Data from Mitchell et al. (2004).**

Colony	Location	SCR Census 1985-88	Seabird 2000 1998-2002	% population change between censuses	Annual %change between censuses
Bempton Cliffs (incl.N. Flamborough Head)	NE England	85,095	42,659	-50%	-5.2%
West Westray (SSSI)	Scotland (Orkney)	31,085	34,864	12%	1.0%
Fowlsheugh (SSSI)	Scotland (east coast)	22,051	19,842	-10%	-0.8%
St Abb's Head to Fast Castle head SSSI	Scotland (east coast)	20,132	16,223	-19%	-1.6%
Fair Isle	Scotland (Shetland)	19,072	8,204	-57%	-5.5%
Berriedale Cliffs (SSSI)	Scotland (east coast)	13,847	24,427	76%	4.5%
Handa	Scotland (west)	10,732	7,013	-35%	-3.5%
Copinsay	Scotland (Orkney)	9,550	4,364	-54%	-5.9%
Noss	Scotland (Shetland)	9,438	2,395	-75%	-8.2%
Clo Mor	Scotland (north coast)	9,020	9,475	5%	0.4%
Isle of May	Scotland (east coast)	6,765	3,639	-46%	-4.3%
Lion's Head	Scotland (east coast)	6,653	5,431	-18%	-1.3%
Farne Islands	NE England	5,915	5,096	-14%	-1.1%
Turturra Heughs	Scotland (east coast)	5,674	3,098	-45%	-4.5%
Colonsay: NW Cliffs	Scotland (west)	5,646	6,485	15%	1.0%
Marwick Head (SSSI)	Scotland (Orkney)	5,509	5,573	1%	0.1%
Berneray	Scotland (west)	5,114	2,613	-49%	-5.0%

**Information from UK Seabird Monitoring Programme: 1986-present.**

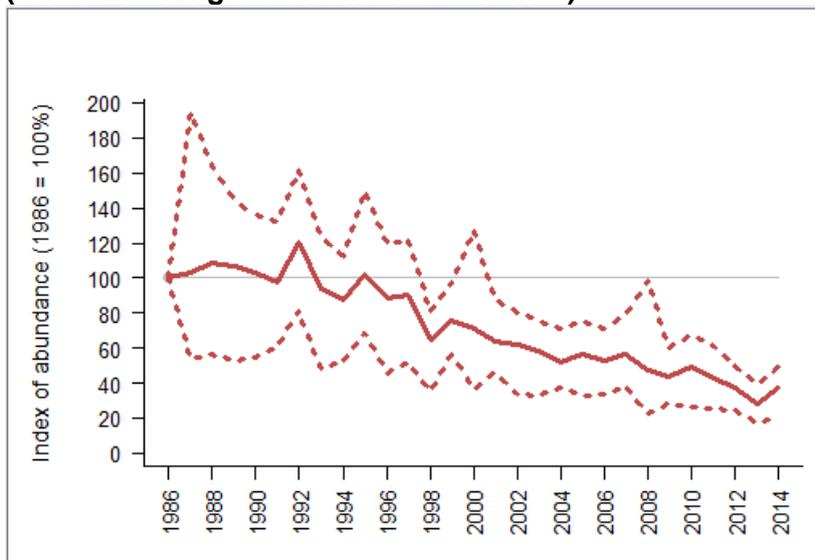
In 1986 an annual monitoring programme - the Seabird Monitoring Programme (SMP) – was established in the UK by a partnership of organisations coordinated by JNCC. The SMP

aims to monitor 26 species of seabird, including kittiwake, at a sample of breeding colonies throughout the UK and Ireland on a regular basis.

However, because not every colony is counted annually, and different combinations of colonies may be counted in different years, it is not possible to sum actual colony counts to calculate national or regional trends. Instead population trends are assessed using annual indices of abundance which are calculated by modelling the counts for individual sites using site and year effect parameters. This is a methodology that is widely applied to ornithological monitoring data where a large number of sites are counted but not all sites are counted in all years in the time series (e.g. see Mountford 1982, Thomas 1993, Underhill & Prys-Jones 1994 and Pannekoek & van Strien 1996). The index model generates “imputed” counts for site and year combinations where count coverage is missing, which allows assessment of population trends over the whole time period. Bootstrap sampling across the sample of sites is used to generate confidence intervals (Thomas 1993). In the case of the SMP data this allows trends to be generated for the period since 1986.

### Seabird Monitoring Programme (SMP) UK Population Trends

**Figure 1. UK Population indices for kittiwake 1986-2014 with 95% confidence intervals (JNCC indexing data from SMP colonies)**



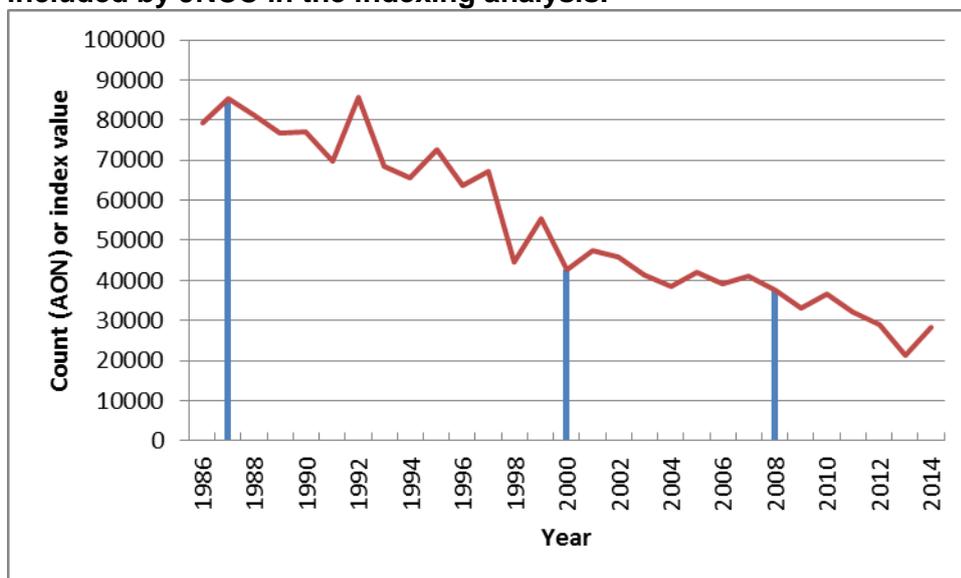
The population index produced by JNCC from SMP data shows that the UK kittiwake population has declined by 4.4% per annum over the period 1986-2014. This index model includes count data from around 240 SMP count units including Flamborough and Filey Coast pSPA. As there are not complete counts for all sites in all years, some of the numbers for individual sites within the index will be represented by imputed counts for the site.

Therefore, since the last seabird colony census in 2000-2002 (Seabird 2000), there is evidence of a continued decline in kittiwake numbers at a UK scale and this is also evident at an individual country level. In Scotland the index shows a steady decline since the late 1980s with the 2013 index level at 23% of the 1986 baseline, a per annum decline of 5.1% (JNCC 2014). In England the index has not fallen to the same extent as in Scotland, but the 2013 index was at 42% of the 1986 baseline, a per annum decline of 3.1% (JNCC 2014). The index for Wales shows a similar pattern to England with a slow decline since the mid-1990s and a 2013 index level at 43% of the 1986 baseline, a decline of 3% per annum (JNCC 2014).

## Flamborough Head and Bempton Cliffs SPA trend

There are a number of SMP colony sites that fall within the Flamborough Head and Bempton Cliffs SPA and the larger Flamborough and Filey Coast pSPA. For the purposes of producing indices, JNCC combines data from count units within the original SPA to give a Flamborough Head and Bempton Cliffs SPA figure. There are three counts for the original Flamborough Head and Bempton Cliffs SPA in the SMP database (Table 3) from 1987, 2000 and 2008. Based on these counts there has been a 56% decline in numbers or 4.1% per annum at the SPA.

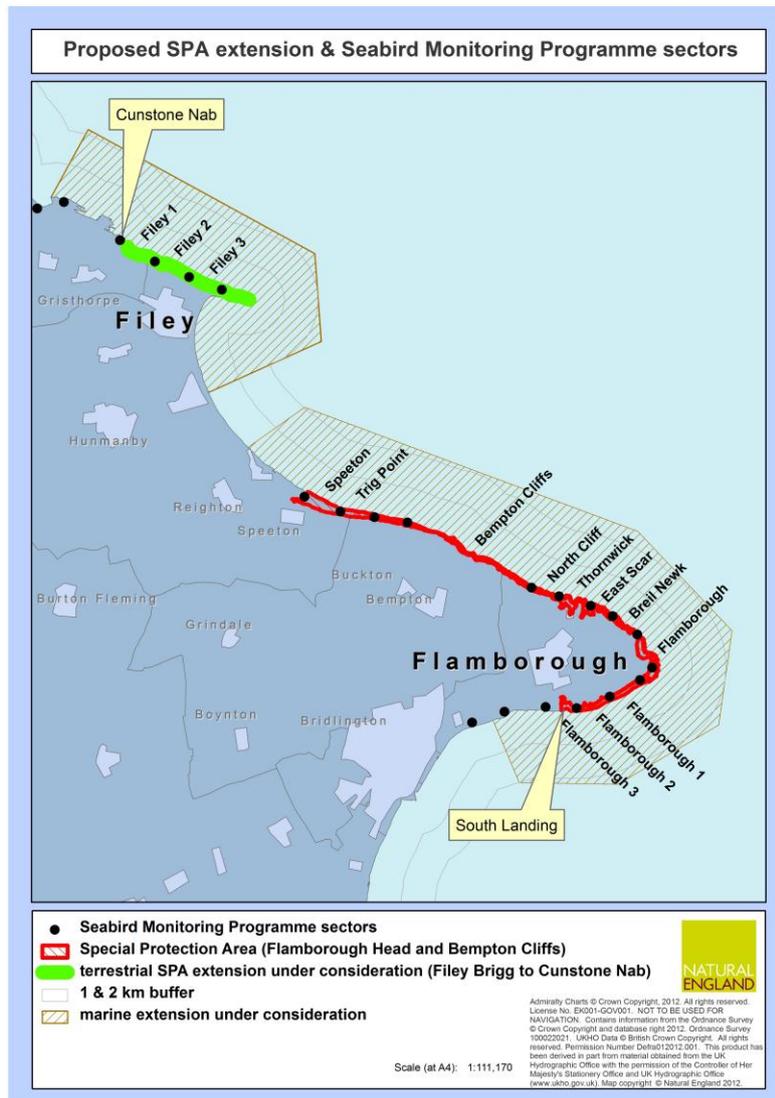
**Figure 2. Colony Counts (AON) for Flamborough Head and Bempton Cliffs SPA, Humberside taken from SMP online database <http://jncc.defra.gov.uk/smp>. Blue bars represent the actual colony counts and red line the index values. For years where count data is missing for the SPA, index values are modelled counts for the site based on a site factor and a year factor that reflects the trend across all UK colonies included by JNCC in the indexing analysis.**



## Flamborough and Filey Coast pSPA - Additional counts for areas within the Filey coast terrestrial extension.

For the Flamborough and Filey Coast pSPA there are additionally three SMP count units that fall within the proposed terrestrial extension area to the north of Flamborough Head: Filey 1; Filey 2; and Filey 3 (Figure 3). However, as coverage of the Flamborough and Bempton Cliffs SPA and the Filey count units is incomplete for the period 1986-2014, with no overlaps, there have been no counts for the Filey coast extension that coincide with original SPA counts (Table 3). It is, therefore, not possible to sum the actual counts across the whole pSPA site for surveyed years due to the missing coverage. However, it should be noted that Flamborough Head and Bempton Cliffs SPA and the three Filey colonies on the coastal cliffs between Filey Brigg and Cunstone Nab that comprise the terrestrial pSPA extension are considered as one population separated by a sandy coastal stretch in Filey Bay, which does not provide suitable breeding habitat.

**Figure 3. Map showing existing Flamborough Head and Bempton Cliffs SPA and proposed terrestrial extension areas for the Flamborough and Filey Coast pSPA that include the Filey 1, Filey 2 and Filey 3 SMP colonies. From FFC pSPA Departmental Brief:**

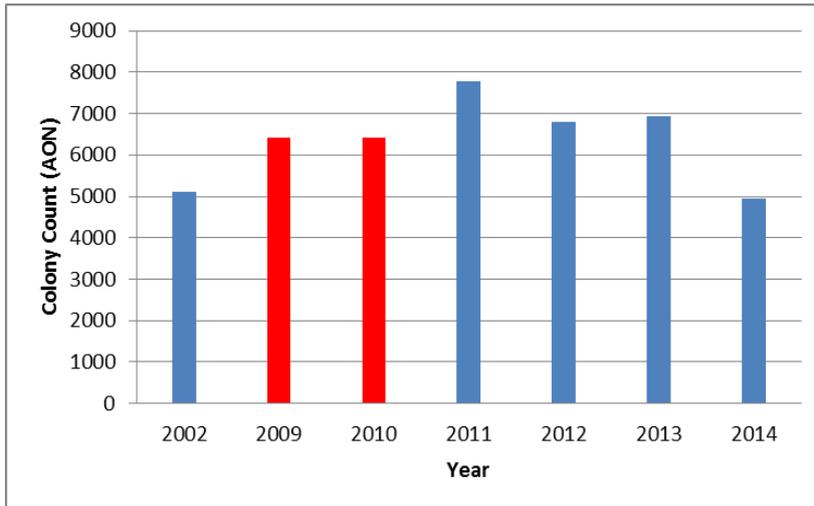


**Table 3. Summary of counts made at the different component colonies of FFC pSPA that are in the SMP database.**

Count Unit	Years with abundance records in SMP
Flamborough and Bampton Cliffs SPA	1987, 2000, 2008
Filey 1	2002, 2011, 2012, 2013, 2014
Filey 2	2002, 2011, 2012, 2013, 2014
Filey 3	2002, 2011, 2012, 2013, 2014

Additionally, the RSPB undertook counts of the Filey coast extension area (covering Filey 1, Filey 2 and Filey 3 count units) in 2009, 2010.

**Figure 4. Counts of kittiwake (AON) in the Filey extension area of the pSPA. Blue bars represent SMP counts summed across the Filey 1, Filey 2 and Filey 3 SMP count units. Red bars represent additional RSPB counts for the Filey extension area.**



Note the non consecutive count years (2002, 2011-14). 2002 count marked as an “estimate” in SMP database, other counts as “accurate”.

The kittiwake count for FFC pSPA in the pSPA departmental brief has been calculated using the 2008 SMP count for Bempton Cliffs and Flamborough Head SPA (37,617 pairs) and the mean count for the Filey coast area in the terrestrial extension counts for 2009, 2010 and 2011 (6,903 pairs). On this basis the addition of the Filey coast kittiwake adds around 7,000 pairs to the original SPA total. The counts indicate that the number of birds using this part of the pSPA have fluctuated between around 5000 and 8000 pairs over the last six years, however it is not clear whether the same pattern has occurred during this period across the larger pSPA area (including the original Flamborough Head and Bempton Cliffs SPA).

**Table 4. Summary of figures used to derive a population estimate for kittiwake at FFC pSPA. Numbers are AON which is considered to reflect breeding pairs.**

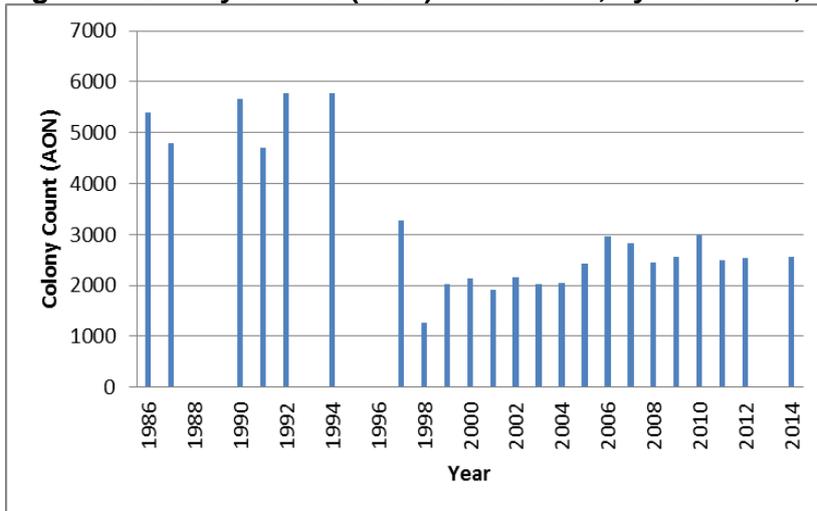
Year	Flamborough head and Bempton Cliffs SPA	Filey Coast	pSPA population (2008-2011)
2008	37,617	-	
2009	-	6,413	
2010	-	6,420	
2011	-	7,877 <sup>1</sup>	
Population	<b>37,617</b>	<b>6,903</b>	<b>44,520</b>

### Population trends at other colonies in North East England

Below (Figure 5-9) are the colony counts for larger colonies (those which have recorded more than 1,000 AON at some point between 1986 and 2014) in the north east of England, and which have a more complete set of counts than FFC pSPA (for some sites there have been counts in every year 1986-2014). The trends on these sites suggest that for several of the larger regional colonies there have been declines in kittiwake numbers since the mid 1980’s, reflecting the trend at the Flamborough Head and Bempton Cliffs SPA site. For some sites there have been continuing declines over the last few years, while at other colonies recent numbers have been more stable.

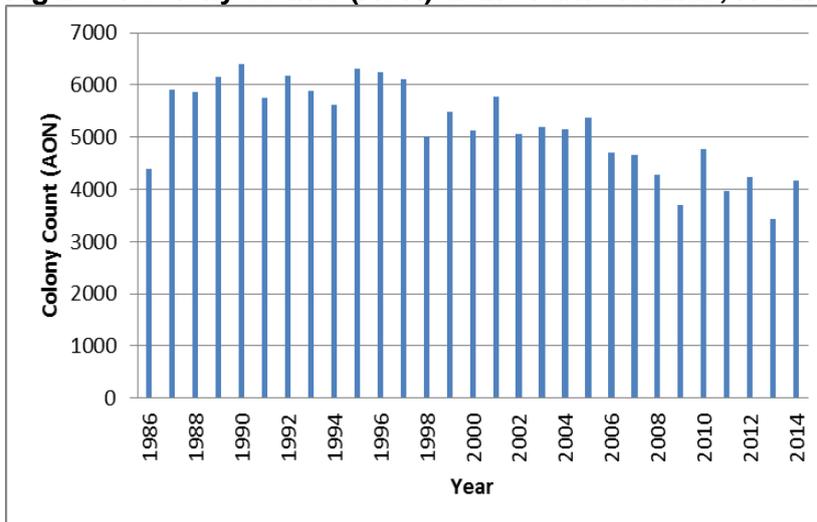
<sup>1</sup> Note that the SMP count for 2011 for Filey 1, Filey 2 and Filey 3 is 7,777 AON. Natural England are currently investigating this small discrepancy.

**Figure 5. Colony counts (AON) at Marsden, Tyne & Wear, 1986-2014.**

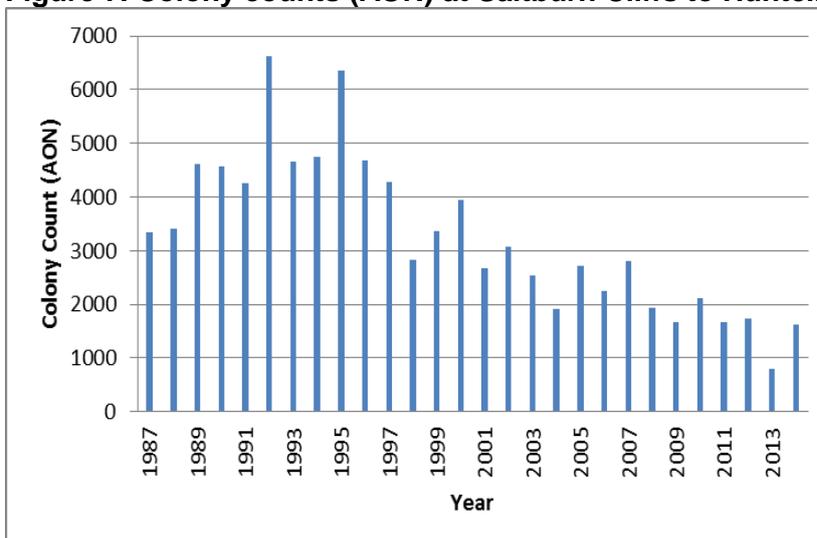


Note that in 1996/97 there was a major cliff fall at this colony which impacted on the colony, therefore the changes in numbers of kittiwake at the colony before and after 1996 may reflect these physical changes at the site.

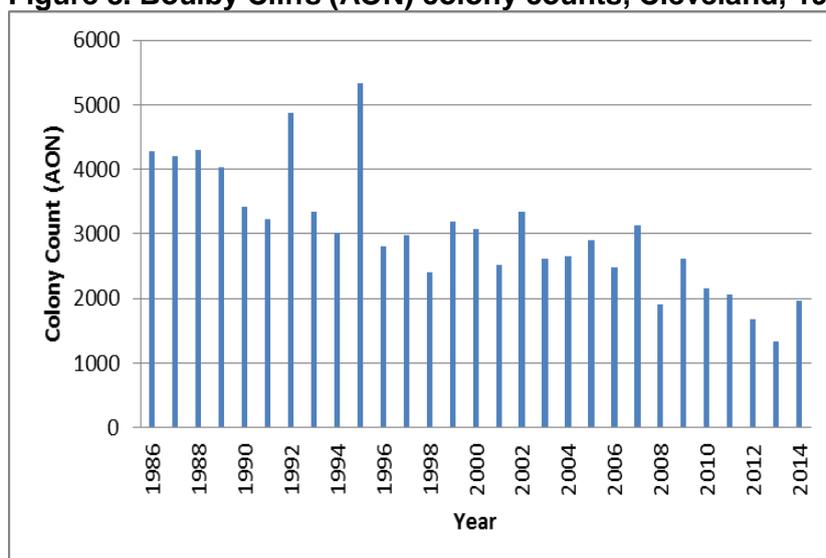
**Figure 6. Colony counts (AON) at the Farne Islands, Northumberland, 1986-2014.**



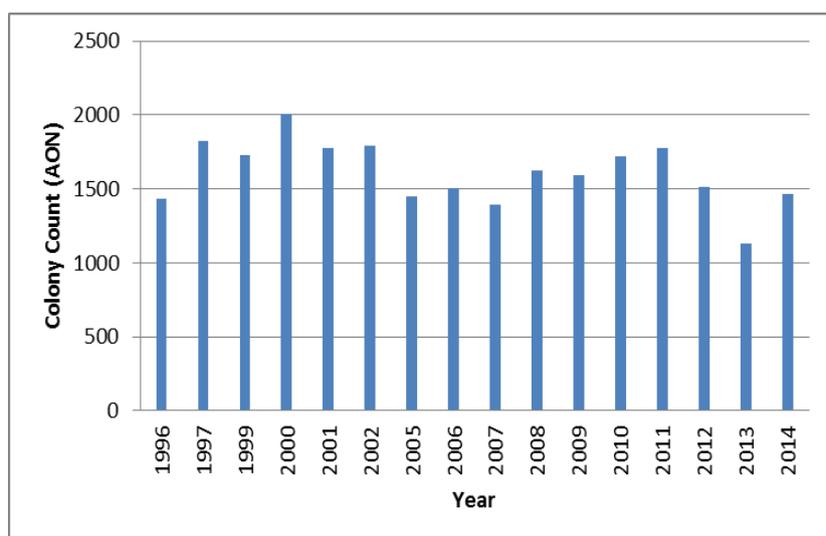
**Figure 7. Colony counts (AON) at Saltburn Cliffs to Huntcliff, Cleveland, 1987-2014.**



**Figure 8. Boulby Cliffs (AON) colony counts, Cleveland, 1987-2014.**



**Figure 9. Castle Headland (AON) colony counts, Cleveland, 1996-2014.**



## Conclusions

- Based on count data from Flamborough Head and Bempton Cliffs SPA the kittiwake population has declined by 56% or 4.1% per annum over the period 1986 to 2008;
- This trend mirrors the national population trend for kittiwake as well as the trend on many of the larger kittiwake colonies in the UK;
- Since 2009 numbers of kittiwake in the terrestrial extension areas for the FFC pSPA have been relatively stable;
- There have been no whole colony count data for the larger, original Flamborough Head and Bempton Cliff SPA since 2008 so we do not know the population trend for this site over recent years;
- Population indices calculated across all UK sites for the period 2008-2013 indicate that kittiwake numbers nationally have continued to decline with the 2013 index value being 31% lower than the 2008 value.

- Based on counts for other colonies in the region as well as counts of the terrestrial extension areas of the FFC pSPA and national indices calculated by JNCC, there is no evidence to suggest that the population across the pSPA as a whole has increased since 2008 and, therefore, we consider that the current trend is most likely to be either stable or a continued decline in line with the national trend;
- Given the strong evidence for a decline in the colony size since the original SPA designation in 1993, and the March 2015 condition assessment of the SSSI putting the site as “unfavourable declining” (<https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S1002289&ReportTitle=FLAMBOROUGH HEAD>), when conservation objectives for kittiwake at the FFC pSPA are set they are likely to be to restore the population to a higher level than the current population size.

### **Kittiwake Apportioning Clarification**

The predicted impact figures for kittiwake collisions apportioned to FFC pSPA in Appendix 2 of Natural England’s deadline 3 submission for the Project alone are based on the apportioning assumptions detailed below.

#### **Breeding season**

For the purposes of assessing potential impacts Natural England defines the breeding season as all times of year when seabirds are present at their colonies and constrained in their foraging movements. Although this will predominantly refer to birds provisioning young, it is also considered to include birds sitting on eggs, courting, nest building, etc i.e. when there is a strong behavioural attachment to the colony site. These periods will be colony and species-specific. Natural England defines the breeding season for kittiwake at FFC pSPA as being April to July. This is based on information provided by colony managers at RSPB Bempton Cliffs Reserve, who have indicated that birds start to return to the colony in mid March and that large numbers are present from April. This is consistent with the published literature that indicates that birds re-occupy colonies from February, with modal return in March (Pennington et al. 2004; Brown and Grice 2005; Forrester et al. 2007). Similarly, a study of geolocator data from individuals from 18 colonies across the North Atlantic range of kittiwake showed that most birds were back in the vicinity of their colonies by the equinox period in April (Fredericksen et al. 2012). Birds breeding in colonies further south in the range return to colonies earlier and peak migration through English waters as recorded at Trektellen seawatching sites in the UK (mostly located in southern and eastern England) was in March (see Furness 2015).

#### **Foraging ranges**

Thaxter et al. (2012) recently summarised knowledge of seabird foraging ranges based on evidence from tracking studies, colony studies and other methods of estimating range. Several metrics can be derived from this approach, including the mean and maximum foraging ranges. Natural England advises (JNCC & NE 2013) that the ‘mean maximum’ range (i.e. the mean of maxima for all studies per species) from Thaxter et al (2012) is a useful guide for identifying SPA colonies that need to be considered for HRA assessments during the breeding season. However, this should be considered as a coarse screening method and, the values in Thaxter et al. (2012) should not be viewed as the only source of available information on foraging ranges and likely connectivity between colonies and project areas.

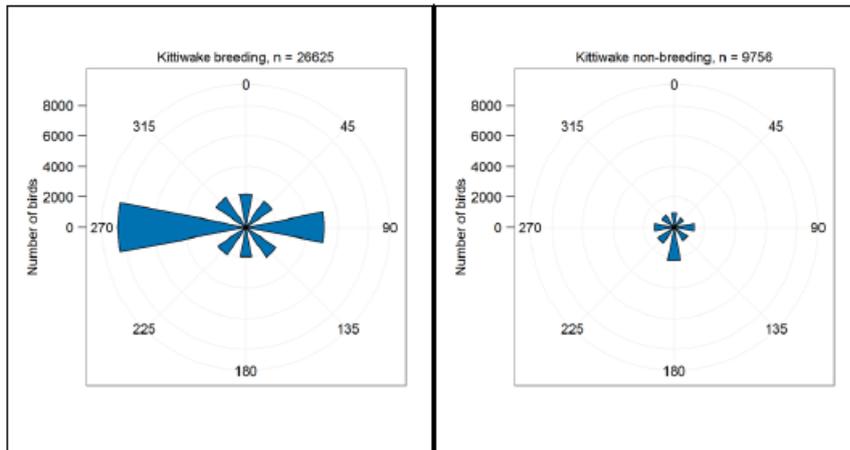
Following the initial screening process, Natural England/JNCC advice is to then:

*“Assess all available colony-specific evidence to examine if connectivity between SPA colonies and the OWF is supported or not. This assessment should be carried out for relevant SPAs within and beyond the relevant mean maximum foraging range. Relevant SPAs are those supporting breeding seabird qualifying features (QFs), which may be commuting to offshore foraging areas; these areas may be coincident with the development site, or commuting trips may pass through the development site. Those SPAs beyond the mean maximum foraging range should include, for example, those within maximum known foraging range or within upper confidence limits around the mean maximum range (Thaxter et al. 2012), where this exceeds the maximum (including any recent unpublished studies that may update this knowledge). Colony-specific data can include tracking research and also field data on behaviour or flight orientation (for example, fish-carrying behaviour at the OWF site implies provisioning chicks at a breeding site; orientation of birds at sea may indicate directional preferences associated with coastal colonies).” (JNCC & Natural England 2013)*

Assessments should always be based upon the best and most up to date evidence available. In some situations, it may be justified to consider screening in SPAs beyond published mean maximum foraging range of the qualifying features. For example, new tracking data may suggest that previous maximum ranges for a species were underestimated; thus, it may be appropriate to derive new maximum and mean maximum ranges. Alternatively, behavioural data from development sites such as offshore wind farms (OWFs) might indicate connectivity to a SPA within maximum, rather than mean maximum, foraging range. Finally, mean maximum values in Thaxter et al. (2012) are presented with standard deviations, and each estimate of foraging range is rated in terms of confidence in its derivation. It may be appropriate to consider the full variability around mean maximum ranges, especially where estimates are made with comparatively low confidence.

Hornsea Project 2 lies between the mean maximum (60km) and maximum foraging ranges (120km) calculated for kittiwake in Thaxter et al (2012). These foraging ranges were based on data from seven colonies but the majority of these were in Alaska and only two UK sites were included in the analysis with no data from the Flamborough Head and Bempton Cliffs colony available to be included. Site specific evidence indicates that birds from FFC pSPA do forage within Hornsea P2 areas during the breeding season. This includes data from tracking studies undertaken by the RSPB which shows that tracked birds were foraging within the Hornsea Project 2 windfarm area, and calculations of mean maximum foraging ranges for birds ranged from 55.7km (SD, +/- 31.9km) to 156.4 km (SD, +/- 28.2km) in different study years, some of which were coincident with the baseline survey data collected for Hornsea P2.

Further evidence to support connectivity between Hornsea Project 2 and FFC pSPA during the breeding season comes from the Project baseline survey data collected over the whole Hornsea survey area (Figure 10) where *“Flight direction was recorded for 26,625 kittiwakes during baseline surveys in the breeding season, and 9,756 kittiwakes in the non-breeding season. In the breeding season, just under half (47.6%) of all birds recorded were flying west, in the general direction of the breeding colony at Flamborough and Filey Coast pSPA. In the non-breeding season, the pattern was less clear, with birds seen flying in every direction fairly equally, with perhaps a slight bias towards flights heading in a southerly direction.” (SMartWind 2015).*



**Figure 10. Flight direction of kittiwake in the Horsea Project area in years 1 and 2 of the baseline surveys (SMartWind 2015a).**

Additionally, peak numbers of kittiwake at Hornsea Project 2 were recorded in the breeding season (peak densities of birds in flight were in July in both survey years) and similarly overall estimates of birds on the water and in the air also peaked in July in both survey years with a high proportion (>85%) of adult birds also recorded during the breeding season months (see Table 6.28 of SMartWind 2015a). This suggests that the Hornsea Project 2 area is important for kittiwake during the breeding season relative to other seasons.

On the basis of the evidence outlined above, Natural England consider that there is a high probability that kittiwake present in the Hornsea Project 2 area during April to July will have connectivity with the FFC pSPA colony. The Applicant's data shows that 94.6% of birds present in the breeding season were adult birds and, therefore, Natural England has assumed that 95% of the birds recorded in the Project area during the breeding season are FFC pSPA adults. Natural England accepts that this assessment may overestimate the proportion of adult birds on the project site, since it is difficult to distinguish older immature birds from adults in the field.

During the non-breeding periods, August-December and January-March, Natural England has based its apportioning assumptions on the non-breeding season population scales defined in Furness (2015). Furness (2015) provides an assessment of the numbers and origins of both adult and immature birds present in North Sea UK waters during the non breeding seasons, including birds from overseas colonies. Based on the figures in Furness (2015), 5.4% of birds in the period August to December and 7.2% of birds in January to March are predicted to be adult birds from FFC pSPA.

Natural England met with the applicant on 14 October 2015 to discuss potential refinements to the apportioning approaches for the breeding season, and will update on progress regarding this matter at the Issue Specific Hearings.

For the in-combination assessment of kittiwake collisions for FFC pSPA presented in Appendix 2 of our submission at deadline 3, Natural England used the collision figures presented by the Applicant in Table 1.7 of SMartWind (2015b) with some adjustments as outlined below in Table 5 and associated notes. Please note that Natural England met with the applicant on 14 October 2015 to discuss potential refinements to the in-combination apportioning approach, and will update on progress regarding this matter at the Issue Specific Hearings.

**Table 5. In-combination collision totals for kittiwake population of Flamborough and Filey Coast pSPA (based on data presented by the Applicant in Table 1.7 of SMartWind (2015b)), which Natural England used to calculate the annual in-combination collision total apportioned to FFC pSPA of around 500 kittiwake presented in Natural England’s Deadline 3 submission (Appendix 2 – HRA kittiwake collision impacts on FFC pSPA).**

Offshore wind farm	Band Model	Option	Avoidance rate (%)	Annual, unapportioned, collisions	Breeding	% Apportioning	pSPA breeding collisions	Post-breeding	% Apportioning	pSPA post breeding collisions	Pre-breeding	% apportioning	pSPA pre breeding collisions
Aberdeen European Offshore Wind Deployment Centre	Band (2012)	2	98.9	18.70				5.8	5.4	0.31	1.1	7.2	0.08
Beatrice	Band (2012)	1	98.9	57.86				4.3	5.4	0.23	15.9	7.2	1.14
Beatrice Demonstrator	Band (2000)	1	99.2	4.95				2.1	5.4	0.11	1.7	7.2	0.12
Blyth Demonstration Project	Band (2011)	1	98.9	5.39	1.8	100.0	1.8	2.3	5.4	0.12	1.4	7.2	0.10
Dogger Bank Creyke Beck Projects A and B	Band (2012)	2	98.9	718.85	288.0	19.3	55.6	135.0	5.4	7.3	295	7.2	21.2
Dogger Bank Teesside Projects A and B	Band (2012)	2	98.9	444.40	136.9	19.3	26.4	90.7	5.4	4.9	216.9	7.2	15.6
Dudgeon	Band (2000)	1	98.9	0.00	0.0	100.0	0.0	0.0	5.4	0.0	0.0	7.2	0.0
East Anglia One	Band (2012)	1	98.9	429				295	5.4	15.9	104.6	7.2	7.53
Galloper	Band et al. (2007)	1	98.9	65.89				27.8	5.4	1.5	31.8	7.2	2.29
Greater Gabbard	Band (2000)	1	98.9	27.50				15.0	5.4	0.81	11.4	7.2	0.82
Hornsea Project One	Band (2012)	1	98.9	122.00	47.9	100.0	47.9	55.9	5.4	2.9	20.9	7.2	1.50
Hornsea Project Two	Band (2012)	2	98.9	230.00	136.0	95.0	129.2	72.0	5.4	3.9	23	7.2	1.66
Humber Gateway	Not available	1	98.9	7.70	2.55	100.0	2.55	3.19	5.4	0.17	1.9	7.2	0.14
Inch Cape	Band (2012)	1	98.9	301.42				224.8	5.4	12.1	63.5	7.2	4.57
Kentish Flats	Band (2012)	1	98.9	2.20				0.9	5.4	0.05	0.7	7.2	0.05
Lincs	Band (2000)	1	98.9	2.75	0.92	100.0	0.92	1.16	5.4	0.06	0.69	7.2	0.05
London Array	Band (2000)	1	98.9	5.50				2.3	5.4	0.12	1.8	7.2	0.13
Moray Firth Project One (MORL)	Band (2012)	1	98.9	45.4				2.0	5.4	0.11	19.3	7.2	1.39
Neart na Gaoithe	Band (2012)	1	98.9	93.39				56.1	5.4	3.0	4.4	7.2	0.32
Race Bank	Band (2000)	1	98.9	31.35	1.86	100.0	1.86	23.9	5.4	1.3	5.59	7.2	0.40

Seagreen Alpha	Band (2012)	1	98.9	371.25				171.1	5.4	9.2	133.8	7.2	9.63
Seagreen Bravo	Band (2012)	1	98.9	343.20				142.4	5.4	7.7	114.0	7.2	8.21
Teesside	Band (2000)	1	98.9	77.08	50.8	100.0	50.8	24.0	5.4	1.3	2.5	7.2	0.18
Thanet	Band (2000)	1	98.9	1.10				0.5	5.4	0.03	0.4	7.2	0.03
Triton Knoll	Band (2000)	1	98.9	209.00	24.6	100.0	24.6	139.0	5.4	7.5	45.4	7.2	3.27
Westermost Rough	Band et al. (2007)	1	98.9	0.55	0.176	100.0	0.176	0.22	5.4	0.01	0.132	7.2	0.01
<b>TOTAL</b>				<b>3616.4</b>			<b>341.8</b>			<b>80.8</b>			<b>80.5</b>

Collisions in Table 1 are based on those presented by the Applicant in Table 1.7 of *Apportioning and assessment of predicted kittiwake mortality of the Flamborough and Filey Coast pSPA population* submitted at Deadline IIa (SMartWind 2015b). Natural England has adjusted some of the figures as explained below to reflect its position regarding seasonality, Band Model Options and apportioning. Additionally Natural England has used seasonal collision figures for Dogger Bank Teesside A&B from Table 2.3 of Forewind's Dogger Bank Teesside A&B Deadline VI *Final HRA ornithology in-combination tables*, as Forewind's figures differed from those presented by the Applicant for that project.

Basic Band Model Option 1 outputs with 98.9 AR are used except for Dogger Bank Creyke Beck and Dogger Bank Teesside, where Natural England agreed use of Option 2 with Forewind due to methodological queries regarding the site specific flight height data. For Hornsea Project 2, Natural England has advised use of Option 2 due to methodological issues around the site specific flight height data. Note that for Hornsea Project One, Natural England considered Option 2 outputs alongside Option 1 outputs for the same reasons, but have retained the Option 1 figures in this table as Option 1 figures were used in the in-combination assessment at Hornsea Project One. The Option 2 annual collision figure would be 257 birds for Hornsea Project One.

Natural England is unclear why the AR for Beatrice Demonstrator is 99.2% in table 1.7 or why Option 2 is cited for EOWDC when Option 1 outputs were presented for the project; however Natural England has not adjusted figures for these two projects.

Apportioning percentages to FFC pSPA during the breeding season are the same as those presented by the Applicant in Table 1.7 of *Apportioning and assessment of predicted kittiwake mortality of the Flamborough and Filey Coast pSPA population* submitted at Deadline IIa, apart from Natural England has calculated breeding season collisions for April to July rather than May to July as calculated by the Applicant.

Apportioning percentages during the non-breeding season are derived from Furness (2015) for the North Sea BDMPS scale for kittiwake during the Spring and Autumn migration periods.

## Section C – Natural England’s detailed response to the Examining Authority’s written question EOO20

**EOO20: Further to the submission of ‘Notes of NE/RCUK Post Consent Monitoring Seminar (March 2015)’ to Deadline 3 (REP3-032), can NE, MMO and RSPB please advise on potential good practice for project specific, and strategic, ornithological impacts monitoring?**

In 2014 the MMO published an updated review of OWF monitoring data to inform recommendations on improving future licence-related monitoring strategies. The report was independently commissioned and overseen by an expert steering group including Cefas, the Crown Estate, The Department of Energy & Climate Change, Defra, MMO, Marine Scotland, Natural England, Natural Resources Wales, and representatives from industry:

*MMO (2014). Review of post-consent offshore wind farm monitoring data associated with licence conditions. A report produced for the Marine Management Organisation, pp 194. MMO Project No: 1031. ISBN: 978-1-909452-24-4. [Report](#)*

The review includes recommendations for post-consent monitoring aims, objectives, licence conditions and best practice methodologies for site specific and strategic monitoring of ornithology impacts.

Recommendations relating to good practice for project specific and strategic ornithological monitoring include:

- Ensuring licence conditions are clearly linked to the monitoring of impacts predicted in the ESs (and supporting technical reports), with species specific objectives focussing on impacts which are predicted to have high significance, or the resolution of uncertainty in potential impacts (e.g. those assessed more qualitatively or which are dependent on particular assumptions e.g. bird densities, flight height behaviour, avoidance rates etc).
- Monitoring should not necessarily only focus on the development site, but should also consider monitoring impacts of effects at protected sites if this would reduce the uncertainty in predictions. For example, understanding the relative connectivity between qualifying bird features of SPAs and the development is a fundamental part of the HRA process. The deployment of tracking devices on birds to inform on the foraging areas of birds from specific colonies, within or outside the breeding season and the relative overlap with the development site may provide important information that reduces the uncertainty in impact predictions. Similarly, the collection of colony counts or demographic information for colonies may improve the accuracy of predictions where such information is lacking or out-of-date.
- Survey design and methodology - ensuring that data on the numbers of birds using the site (and, depending on survey design, wider areas around this or control sites) are collected in a manner that allows adequate statistical comparisons to be made between baseline, during construction and post-construction periods including:
  - Providing details of monitoring protocols and ensuring details regarding the analyses to be undertaken are determined at the outset of the study;

- Using power analysis to help determine the most appropriate survey design in order to be able to detect changes in numbers. The power to detect change from survey data alone is related to the frequency of surveys, their temporal extent and spatial coverage. Data need to be collected over a sufficient number of years to enable detection of changes accounting for year-to-year variability in numbers. Sufficient within year data needs to be collected to cover the key months for receptor species at the site and to account for changes in seasonal phenology. To adequately characterise the baseline numbers of seabirds, at least three years of pre-construction monitoring are required in order to account for inter-annual variation. Post-construction monitoring should be undertaken annually. With respect to displacement, evaluation on an annual basis will also enable the potential for displacement effects to reduce through habituation to be explored. Collection of additional environmental covariate data could improve the power of the surveys to detect changes and should be considered.
- Ensuring that spatial extent of survey area is sufficient to detect changes based on proposed analyses - this may require surveying an area much larger than the OWF footprint - buffers of 4km may be too small for some survey designs;
- Due to difficulties in identifying reference sites which are truly comparable in terms of their environmental conditions, the use of Before and After Control Impact (BACI) survey designs for monitoring the displacement of seabirds has recently been questioned. Use of alternatives such a Before-After-Gradient (BAG) approach, in conjunction with the use of density surface modelling techniques is recommended;
- The use of density surface modelling techniques enables environmental correlates to be accounted for, such that changes in densities that might be a result of the construction or operation of the wind farm may be better evaluated. The inclusion of temporally varying covariates rather than solely static covariates (ideally environmental data that is collected simultaneously to the bird surveys) is desirable.
- Strategic monitoring – Co-ordinated regional monitoring studies should be encouraged where practicable (e.g. for wind farms developed in close proximity to each other; where the ornithological features of concern and the monitoring objectives are similar or are linked to the same colonies; where monitoring is required on a different spatial scale to a single project to test hypotheses).
- Incorporating existing data from sites nearby to inform baselines, ESs and licence conditions where appropriate will improve understanding of the site prior to construction – for example, if ecological conditions are similar, impacts are also likely to be similar.

Further details on good practice for project specific, and strategic, ornithological impacts monitoring can be found in the report.

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