

From: Dawkins, James [<mailto:James.Dawkins@rspb.org.uk>]
Sent: 12 November 2015 23:21
To: Hornsea2
Subject: RSPB submission for Hornsea Project 2 Deadline 5
Importance: High

Dear Katherine,

I attach the RSPB's response for Deadline 5. Please could you confirm safe receipt?

I wish to draw your attention to one important issue which has just arisen.

The RSPB was informed by the Applicant at 4.25 yesterday (Wednesday) afternoon that further information would be coming concerning important aspects of the offshore site. The RSPB will obviously need time to review this information and if necessary request clarification and possible further information from the Applicant on it, before being able to confirm what our views, comments, concerns, etc might be and how this changes our offshore position.

Knowing that this further information was being submitted today has had an inevitable impact on our ability to consider some aspects of the new information submitted by the Applicant for Deadline 4 as we know that matters will be changing again. Therefore the RSPB has not responded to some of the Applicant's Deadline 4 submissions on SPA species and offshore impacts. We wanted to be clear that this is not because we have no comments on them, but until this new information has been submitted we saw no purpose in setting out views on information that was about to change.

The RSPB will be reviewing the information once submitted by the Applicant at Deadline 5 and it may be necessary to make a more formal representation on this issue to the Examining Authority depending on what impact this new information has on the RSPB.

Kind regards,

James Dawkins

Casework Officer
Reserves and Protected Areas Department

UK Headquarters The Lodge, Sandy, Bedfordshire SG19 2DL
Tel 01767 693284
Fax 01767 685400

rspb.org.uk

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**Deadline V Submission
for
The Royal Society for the Protection of Birds**

12 November 2015

Planning Act 2008 (as amended)

In the matter of:

**Application by SMartWind for an Order granting Development Consent for the
Hornsea Offshore Wind Farm – Project Two**

**Planning Inspectorate Ref: EN010053
Registration Identification Ref: 10031166**



1. Introduction

Section 2 contains the RSPB's oral submissions made at the Issue Specific Hearing on 27 October 2015. Section 3 contains the RSPB's detailed written submissions on the Applicant's documents submitted for Deadline 4 which the RSPB was unable to consider in detail ahead of that Issue Specific Hearing.

To avoid repetition between sections 2 and 3 we have cross-referenced from section 2 wherever our response in section 3 expands on the points that we made at the Issue Specific Hearing.

2. Summary of Oral Submissions made at the Issue Specific Hearing on 27 October 2015

Our written summary of those submissions are set out in the order that they were made along with the corresponding ISH Agenda numbers.

2 – General

The RSPB is continuing to discuss the draft intertidal requirements and conditions with the Applicant and hope to be able to conclude a SoCG on these matters shortly.

3. CL: Construction Onshore and Inter-tidal

3.4 Update on the Intertidal Access Management Plan

The RSPB notes the Applicant's statement at the hearing that the Intertidal Access Management Plan will not be drawn up until after the Secretary of State's decision on this application. As no detail is available now it is therefore not possible for the RSPB to comment further and see whether it may address our concerns. The RSPB sets out its concerns in relation to this issue at **Appendix R - Intertidal Clarification Note (produced for NE)** below.

8. EOO: Ecology Offshore – Ornithology

8.1 Update on HRA matrices, including for a) Flamborough Head and Bempton Cliffs (FHBC) SPA; and (b) for the Greater Wash dSPA.

a) Flamborough Head and Bempton Cliffs SPA

The RSPB received and notes the change to the deadlines for the Report on the Implications for European Sites (RIES) and that it will be sent round at Deadline 6 and comments requested from the parties for Deadline 7.

b) Greater Wash dSPA

The RSPB expressed its concerns about the potential impacts of the construction and operation of the Hornsea 2 project on the proposed Greater Wash SPA.

In summary we consider that no information is currently available for the magnitude of the impacts upon any of the interest features of the proposed SPA, including information on where and when the impacts might be experienced. In addition there is currently no information about the distribution of boat traffic in relation to construction, operation or decommissioning stages for the wind farm.

Since the hearing we have received further information from Natural England concerning this site, and have used it to set out an updated and more detailed response to SMartWind's **Appendix FF - Possible Greater Wash SPA Shadow HRA Screening** below.

8.3 Update on latest (final?) position agreed between NE and the Applicant on the effects of Hornsea Project 2 on the Special Protection Areas (SPA and pSPA) population of kittiwake, and assemblage features, with particular reference to recent areas of disagreement. And

8.4 Update on progress and extent of agreed positions, between RSPB and the Applicant, on the effects of Hornsea Project 2 on Special Protection Areas (SPA and pSPA) populations of gannet, kittiwake, guillemot, razorbill and puffin, for the project alone and in combination. RSPB differences from NE analysis and conclusions should also be clarified.

Dealt with together as follows:

Before setting out its position on the SPA species including the Assemblage features, the RSPB had some points of principle for all species that it was relevant to discuss first.

The RSPB's areas of agreement and disagreement with the Applicant are set out in the Statement of Common Ground (Applicant's Appendix Z, submitted at Deadline 3). The RSPB are largely in agreement with Natural England and the differences are not methodological, rather they are in the final conclusions drawn from those methods.

Since the Hornsea Project 1 there has been a profound shift in the means for determining how best to assess wind farm impacts, and the RSPB are in agreement with NE on the majority of their current assessment. In particular we welcome the consensus that the most robust means for assessing population scale impacts is through counterfactual outputs of density independent PVA models. This was in direct response to the RSPB's input into the Hornsea Project 1 first Issue Specific Hearing.

We also agree with NE on the correct collision risk model version and options to use, flight height distributions, the majority of avoidance rate values, the range of displacement rates and mortalities, apportioning to SPAs (and the pSPA), and percentage adults and timing of breeding seasons.

The RSPB differences from NE are as follows:

- The avoidance rate for the breeding season for gannet.
- Displacement mortality shown is considered by NE to be the upper limit of the considered range, the RSPB consider this to be a reasonable figure.

These will be discussed under the species specific headings

There is also a slight difference in the preferred output metric of PVA models between NE and the RSPB, however the two metrics are similar, closely related mathematically and provide important contextual information. Both use exactly the same models, and crucially the same input mortalities.

The PVA from which these metrics are calculated is a theoretical model, the most robust outputs of which are comparative, or counterfactual. Any other predictions, such as future population size or growth rate are unreliable.

The RSPB preferred metric is the Counterfactual of Population Size (CPS), NE's preference is the Counterfactual of Population Growth Rate (CPGR). Both are mathematically related. The difference is essentially in interpretation, where NE compare the CPGR with current population growth rate, whereas the CPS is simply the ratio of the expected population size with the wind farm to that without it. which although it cannot remove the high level of uncertainty about the magnitude of effects of wind farms on demographic rates, has the virtue of neither concealing nor adding to that uncertainty. However NE's approach, using current population growth as a snapshot has the weakness that we cannot interpret this measurement as a comparison with future growth rates, as we do not know these, and it is impossible to predict them, (as acknowledged by the authors of the PVA report, Appendix M, p13 to Deadline 2A).

The RSPB prefer the counterfactual of population size after 25 years, as this has the cleanest output, with the least uncertainty, requires no further projections (modelling) in order to examine its results in the light of the conservation objectives of the SPA and its species along with supporting population information.

Gannet

The reason for the difference between Natural England and the RSPB in their preferred avoidance rates for gannet is that the avoidance rate review carried out by the BTO for gannet was almost entirely based on non-breeding, migrating birds. It would be expected that breeding gannets would behave differently from non-breeding birds, and recent work by Cleasby et al., ((2015), discussed below) demonstrated that birds foraging flew higher, and were therefore at greater risk of collision, than commuting birds. In light of this recent evidence, and given that the BTO review was so heavily biased to non breeding birds, while we accept the rate for non-breeding season, we prefer a lower, more precautionary rate for breeding season.

The key contextual information is provided by the recent Cleasby *et al.*, (2015) paper (discussed below). However the main conclusion we take from that paper is that the collisions risk estimates presented by the Applicant are very likely to be significant underestimates.

PVA modelling predicts a decrease in population size of 5% with the Project alone, and of 25.5% in combination. As such, the RSPB is unable to rule out the possibility of an adverse effect on gannets and therefore

- **Maintains its objection on the grounds of potential impact on the gannet pSPA population through the project alone; and**
- **Maintains its objection on the grounds of potential impact on the gannet pSPA population through the project in combination with other projects.**

Although the tables in this section were not discussed specifically at the Issue Specific hearing and the information they contain is in the RSPB's Deadline 4 response, we thought it useful to

set that information out again so the differences in the Applicant, NE and the RSPB's figures can be seen.

Table 1. The population counterfactuals predicted by density independent PVA as a result of gannet mortalities predicted as a result of Hornsea Project 2. CPS is the Counterfactual of Population Size, CPGR is the Counterfactual of Population Growth Rate. CPS is the RSPB's preferred metric

	Alone		In-combination	
	CPS	CPGR	CPS	CPGR
SMartWind	1.6	0.07	20.9	1.00
Natural England	4.0	0.17	18.7	0.87
RSPB	5.0	0.22	25.5	1.24

Kittiwake

The key contextual information for the assessment of kittiwake is, as clearly shown in the NE submission to Deadline 4, that the kittiwake populations of the SPA and pSPA have been declining by approximately 50%, and this decline is in line with regional and national trends. In the context of this decline any additional mortality on the scale of current predictions is unacceptable.

Whilst we did not have time to fully review the Applicant's recent submissions on kittiwake (Appendices DD and EE) before the Issue Specific Hearing, we noted that its review of kittiwake potential collision height (PCH) values omits important offshore sites, notably East Anglia Projects 1 and 3 and Seagreen Alpha and Bravo, which recorded PCH values of, respectively, 14.0, 21.3, 10.6 and 16.1.

PVA modelling predicts a decrease in population size of 3.5% with the Project alone, and of 12.5% in combination. As such, the RSPB is unable to rule out the possibility of an adverse effect on this SPA species and therefore

- **Maintains its objection on the grounds of potential impact on the kittiwake pSPA population through the project alone; and**
- **Maintains its objection on the grounds of potential impact on the kittiwake pSPA population through the project in combination with other projects.**

Table 2. The population counterfactuals as a result of kittiwake mortalities predicted as a result of Hornsea Project 2. CPS is the Counterfactual of Population Size, CPGR is the Counterfactual of Population Growth Rate. CPS is the RSPBs preferred metric

	Alone		In-combination	
	CPS	CPGR	CPS	CPGR
SMartWind	0.2	0.01	3.8	0.16
Natural England	3.5	0.15	12.5	0.57

During the discussions about kittiwake Professor Glasson the lead Examiner asked about the Furness (2015) BDMPS report, in particular table 15.1, which describes kittiwake population trends at all the suite of UK SPAs, and asked why the column describing population trends, “Site Condition Monitoring”, was empty for the Flamborough and Filey Head SPA, and whether it was though that the kittiwake population was declining.

The RSPB believe that the available evidence strongly suggests that the SPA and pSPA kittiwake population is declining, while acknowledges that there will always be some element of uncertainty in any such assessment. At the time of the Examiner’s question we had thought that the reason for this column being blank in the Furness report was this uncertainty, however having checked the Furness report, the reason is simply that this column refers to Scottish sites only. In Scotland, Scottish Natural Heritage provide data and information on key protected areas including Site Conditioning Monitoring on their website, and this is what is being referred to in Furness (2015). Natural Resources Wales and Natural England do not provide this information in such an accessible form, hence this column being blank for SPAs in the other UK countries. This is true not only for kittiwake, but for all the species included in the report. This is dealt with in more detail in the in the attached Appendix.

Auks

The reason for the slight difference in the NE and RSPB positions in displacement focal range for auks is that there is very little survey data for calculating displacement rates of auks, but what there is includes potential displacement of 70%. It is entirely plausible that displacement could occur at higher rates than this, so the RSPB views this as a reasonable value. Conversely NE, while acknowledging that the displacement rate could be higher, take 70% as the maximum of the range focussed on in their assessment.

The UK has a significant proportion of the biogeographical and global population of both guillemot and razorbill, and as such has a responsibility to protect this population. The potential decreases in population size predicted by PVA modelling, namely a decrease of 8.1% with the Project alone, and of 33.8% in combination for guillemot, and 10.9% with the Project alone, and of 34.2% in combination for razorbill are considerable.

In addition, although not raised during the ISH the RSPB would like to draw to the Examining Authority's attention the recent reassessment of the international puffin population by the International Union for the Conservation of Nature (IUCN) as *vulnerable*.

The IUCN Red List of Threatened Species is widely recognized as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species.

This goal includes the "traditional" role of The IUCN Red List in identifying particular species at risk of extinction. While the role of The IUCN Red List in underpinning priority-setting processes for single species remains of critical importance, the goal has been expanded to encompass the use of data from the Red List for multi-species analyses in order to identify and monitor trends in species status and to catalyse appropriate conservation action.

The IUCN Red List was updated on 29th October 2015 and razorbill and puffin both had their criteria changed due to further concerns about their status¹.

Razorbill - were deemed of global conservation concern and their listing change from *least concern* to *near threatened*² due to this species undergoing moderate declines in Europe, including very rapid declines in Iceland since 2005. Crashes in sandeel stocks around Iceland may be a contributing factor in the declines. The species has therefore been uplisted to Near Threatened as it almost meets the requirements for listing as threatened³.

As such, the RSPB is unable to rule out the possibility of an adverse effect on these SPA species and therefore

- **Maintains its objection on the grounds of potential impact on the guillemot and razorbill pSPA population through the project alone; and**
- **Maintains its objection on the grounds of potential impact on the guillemot and razorbill pSPA population through the project in combination with other projects.**

Table 3. The population counterfactuals as a result of guillemot mortalities predicted as a result of Hornsea Project 2. CPS is the Counterfactual of Population Size, CPGR is the Counterfactual of Population Growth Rate. CPS is the RSPB's preferred metric

	Alone		In-combination	
	CPS	CPGR	CPS	CPGR
SMartWind	0.8	0.04	8.1	0.36
Natural England	8.1	0.37	33.8	1.78

¹ <http://www.birdlife.org/globally-threatened-bird-forums/2015/10/global-iucn-red-list-for-birds-2015-changes/>

² Near threatened (**NT**) - A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

³ <http://www.birdlife.org/datazone/species/factsheet/22694852>

Table 4. The population counterfactuals as a result of razorbill mortalities predicted as a result of Hornsea Project 2. CPS is the Counterfactual of Population Size, CPGR is the Counterfactual of Population Growth Rate. CPS is the RSPB’s preferred metric

	Alone		In-combination	
	CPS	CPGR	CPS	CPGR
SMartWind	4.2	0.19	4.9	0.22
Natural England	10.9	0.50	34.2	1.83

Puffin

Despite the difficulties in counting puffin breeding attempts, it is extremely likely that the pSPA population has decreased since 2000. This matches the trends for large declines recorded at those colonies with regular counts, such as Farne Islands in Northumberland and the Isle of May in the Firth of Forth. PVA modelling predicts a decrease in population size of 14.7% with the Project alone, and of 48.2% in combination. In the context of the global and national population decline, such large reductions in population size are unacceptable.

As mentioned above the IUCN Red List was updated on 29th October 2015 and razorbill and puffin both had their criteria changed due to further concerns about their status⁴.

Atlantic Puffin - are also deemed of global conservation concern and their listed change from *least concern* to *vulnerable*⁵, due to this species has experienced rapid declines across its European range. Population trends outside Europe are unknown. Extrapolated over three generation lengths and allowing for uncertainty, the population is thought to be declining at a rate sufficient to trigger Vulnerable under the population size criterion⁶.

As such, the RSPB is unable to rule out the possibility of an adverse effect on this SPA species and therefore:

- **Maintains its objection on the grounds of potential impact on the puffin pSPA population through the project alone; and**
- **Maintains its objection on the grounds of potential impact on the puffin pSPA population through the project in combination with other projects.**

⁴ <http://www.birdlife.org/globally-threatened-bird-forums/2015/10/global-iucn-red-list-for-birds-2015-changes/>

⁵ Vulnerable (VU) - A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria Vulnerable (for example there has been an observed, estimated, inferred or suspected population size reduction of ≥30% over the last 10 years or three generations) and it is therefore considered to be facing a high risk of extinction in the wild.

⁶ <http://www.birdlife.org/datazone/species/factsheet/22694927>

Table 5. The population counterfactuals as a result of puffin mortalities predicted as a result of Hornsea Project 2. CPS is the Counterfactual of Population Size, CPGR is the Counterfactual of Population Growth Rate. CPS is the RSPB’s preferred metric

	Alone		In-combination	
	CPS	CPGR	CPS	CPGR
SMartWind	1.2	0.05	10.3	0.44
Natural England	14.7	0.65	48.2	2.69

The Assemblage

In addition to the consideration of the Flamborough SPA/pSPA species on their own, regard must be had to the additional reason for the pSPA namely the breeding seabird assemblage, to which all of the individual species under consideration contribute. It is important to recognise therefore that any assessment of effects on individual species must then be followed by consideration of all the effects together, such that any resulting impact on the breeding seabird assemblage can then be assessed. This should occur even before other plans and projects that may contribute to the effects on the SPA and its species are considered.

Once drafted the Conservation Objectives will equally apply to the Flamborough pSPA breeding seabird assemblage (as the current Conservation Objectives for the SPA set out) as they do to the individual SPA species and therefore a population decline to that assemblage, in our view, is inconsistent with that objective.

In Conclusion, we support NE in their assessment of kittiwake, but go further than them on other species. It is important to note that both NE and the RSPB strongly prefer the outputs of density independent models as the parameters needed to define the strength and form of density dependence remain unknown (as discussed in detail previously and set out in the RSPB response to Deadline 4). The evidence for the values used by the Applicant to support its density dependence calculations is entirely drawn from a single paper, Cury et al., (2011). While this is an excellent paper, discussing food supply and breeding success, it does not give any information from which these parameters to define density dependence can be derived. Also please note that in this paper the statistical means to derive confidence intervals for the modelling is bootstrapping, the same technique used by Johnston et al (2014) and welcomed by both NE and the RSPB.

It is not only the chance of being wrong that is important, but also the scale of the damage caused by being wrong.

8.5 Views of Applicant, NE and RSPB on recent research study on potential impacts of offshore wind farms on gannet populations (Journal of Applied Ecology, 2015, DOI: 1111/1365-2664.12529).

The RSPB welcomes this paper and our thoughts on it are summarised below. In addition, we have provided more detail commentary on it in the attached Appendix.

The paper presents potential reasons for the discrepancy in flight heights between those measured (as in this paper) and estimated (by boat based surveyors). The following points are important in this context:

- This is the first study to fully use measured flight heights, using altimeters attached to breeding gannets at Bass Rock.
- The technology used gave a very accurate measurement, including an indication of error, and we are confident in the data presented.
- Differentiated between foraging and commuting flight behaviour.
- Showed a bimodal distribution of flight height, as foraging flights were higher than commuting flights, and more at risk of collision.
- The flights further offshore were more often foraging flights, which were higher and therefore at greater risk of collision. Demonstrates that gannet flying further offshore (cf Hornsea) are more at risk of collision.

The paper also explains that there is a discrepancy between flight heights due to:

- Inaccuracy of observer height estimation (applies across all CRM species); and
- Boat attraction (applies to gannet and gulls, including kittiwake).

The relevance of this paper to the Hornsea Project 2 Application is that it

- Demonstrates that gannet collision estimates based on height derived from boat surveys are likely to seriously underestimate collision risk.
- Collision of other species, especially kittiwake are also likely to be underestimates.
- Based on the results the in-combination assessment presented by the Applicant is likely to be a serious underestimate, as the predictions within the paper were not for all four of the Forth & Tay offshore windfarms.
- Hornsea is further offshore than the Forth & Tay windfarms considered and is therefore likely to have greater collision risk.
- It highlights the difference between migratory flight behaviour and breeding season flight behaviour which is important in the derivation of avoidance rates for different seasons.

8.6 Update on the positions reached in SoCG of the effects of Hornsea Project 2 on EIA species.

The RSPB are unable to reach a conclusion in the absence of a PVA. It continues to be our view that PBR is not an appropriate means to calculate effects on these species.

8.7 Update on migratory bird collision risk.

The RSPB position awaits further submissions from the Applicant for Deadline 5.

8.8 Nature and inclusion in the DCO/Deemed Marine Licences (DMLs) of the details for the monitoring of offshore ornithological impacts.

The RSPB provided comments on the need for offshore ornithological monitoring in its answer to the ExA question EOO20 submitted for Deadline 4. In addition set out below are our detailed comments on the Applicant's proposed monitoring as set out in its Appendix P *In Principle Monitoring Plan* and Appendix N *Enhancement, Mitigation and Monitoring Commitments* submitted for Deadline 4.

9. EL: Ecology Onshore and Inter-tidal

9.1 Update on intertidal issues related to:

- the applicable tide height above chart datum (CD) at Grimsby and working tide height at the cable landfall area;

The RSPB is continuing to discuss the draft intertidal construction conditions with the Applicant. We welcome the clarification by the Applicant that tide heights relate to 6.5m Chart Datum.

We set out a more detailed response on this issue, picking up matters from the Applicant's Response to Deadline 4, in our comments on the Applicant's response to the ExA question EL20 below.

- the length of the summer construction working window; the tailpiece on Condition 20(3) of DML A2/B2, which allows winter working with the agreement from the Marine Management Organisation (MMO) and NE; and

If a suitable revision to condition 20 is included in the DCO the RSPB would not have outstanding concerns on this issue. We return to this issue in our consideration of the DCO below.

- assessment of the effects on the intertidal zone from carrying out ducting over three years.

The RSPB notes the confirmation by the Applicant in its answer to the ExA question EL18 that the ES assessed the effects on the intertidal zone from carrying out the ducting over three years. However, for the reasons set out in Appendix 1 to our Deadline 2 response the RSPB considers that it is still possible for the work to be done in two years, and that there is the potential to complete the work in no more than three months in each of those two years.

9.2 Update on NE/Applicant position on the effects of Hornsea Project 2, (i) alone and (ii) in combination, on features of: a) the Humber Estuary SPA; b) the Humber Estuary Ramsar site; and c) the Humber Estuary SAC.

a) If an appropriate condition regulating construction work on the intertidal zone can be included into condition 20(4) of DMLs A2 and B2 the RSPB considers that impacts on the Humber Estuary alone and in combination can be avoided. However, the RSPB is still in discussion with the Applicant over this condition.

3. The RSPB's Responses to other Parties' Deadline 4 Submissions

The RSPB has the following comments to make on other parties' answers to the Examining Authority's Second Written Questions.

EL Ecology – onshore and intertidal

EL17: Similarly, please provide an update on the RSPB proposal that the tailpiece on Condition 20(3) of DML A2/B2, which allows winter working with the agreement from MMO and NE to be removed. Have the potential effects of this tailpiece on the Condition been assessed in the HRA?

The RSPB notes the key point made by Applicant in para 2 of its answer to this question that

“The Applicant requires the flexibility provided by this wording in order to cover a situation where, for example, construction were to experience unforeseen delays and requires a very limited overlap with the onset of the overwintering period (i.e., a couple of days) to achieve completion.”

The RSPB notes the MMO's response to the ExA Question EL17 (the tailpiece to condition 20(3) of DML A2/B2 which permits winter working):

“Whilst the MMO is content with the current wording of the condition, if the applicant considers that such a proposal is likely then it would be more beneficial if this could be resolved prior to determination.”

The RSPB supports this position and continues to work with the Applicant to find a workable outcome to address the concerns expressed by the Applicant for example the ability to remove equipment from the intertidal working area at the end of the summer working window. We consider that the wording as currently proposed within the DCO does not properly address the concerns of the Applicant and continue to discuss this issue with them.

The RSPB understand that delays may occur during the construction period and if, for example, construction equipment needs to be removed from the intertidal area after the end of the construction window to avoid it being left there over the winter that needs to be done. However, the RSPB considers that the current wording of Condition 20(3) substantially exceeds the duration required for this purpose, and consequently we are keen to seek an alternative wording that would permit such exceptional, and time limited, works but no more. We are currently discussing this matter with the Applicant.

EL20 How close is the Hornsea Project 2 cable land fall to the high tide roost at Tetney?

The RSPB notes the answer provided to this question by the Applicant. However, due to progress in subsequent discussions with the Applicant we consider that the discussions have largely overtaken the answer provided here. Consequently we do not comment in detail on it here.

However we do wish to add that the two Rehfish et al references cited by the Applicant in its answer to this question suggest that shorebirds will simply move to another roost site in the estuary. But the Rehfish et al 2003 paper shows (with the exception of bar-tailed godwit and

knot) that 94% of waders stayed in the same sector of the estuary, so are remarkably site-faithful. They also state that when shorebirds are moulting (usually in the autumn);

“...they are vulnerable to predation and need plentiful food supplies and undisturbed roosts. A potential conflict between these requirements arises if birds have to fly further between roosting and feeding areas, to satisfy both needs, at a time when moult makes them less able fliers.”

Wading birds will use a safe, undisturbed roost close to their favoured feeding area. If the roost is too frequently disturbed, the birds may abandon the roost and its associated feeding grounds. But if the favoured feeding grounds become depleted, they will move to another area, and use a roost close to the new feeding area. It is important to note that there are no other undisturbed roosting areas on the Estuary that would be used by birds displaced by construction activities here (please see the RSPB Additional Response to Deadline 4, para 8.)

EL21 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:

a) the Humber Estuary SPA;

b) the Humber Estuary Ramsar site; and

c) the Humber Estuary SAC.

The RSPB note the Applicant’s answer to part a) of the question. For the reasons we set out in our answer to this question we consider that it is not possible to conclude that effects on the Humber Estuary SPA will be avoided, subject to ongoing discussion with the Applicant concerning construction work conditions.

The RSPB made no comment on parts b) and c) in its response to the question and consequently makes no comment in response to answers provided.

CL Construction – onshore and intertidal

CL25 With regard to the Intertidal Access Management Plan, please advise on:

a) progress made; and

b) how the plan is secured?

The RSPB notes the Applicant’s statement in para 1 of its answer to this question. However, we wish to clarify that no consultation with the RSPB has taken place in relation to this document: the RSPB has been informed that it was being prepared, but no more. As indicated at para 3.4 of our Oral Submission above, as no details are currently available now or will be until after the Secretary of State has determined this application, it is therefore not possible for the RSPB to comment further and see whether this plan may address our concerns.

We provide comments in response to the latest version of the DCO and the Applicant’s Deadline 4 Appendix R below, which is referred to in para 1 of the Applicant’s answer to this question.

CL26 Are the RSPB and NE satisfied with the scope of contents of the Code of Construction Practice (CoCP), including how the role of the Ecological Clerk of Works (ECOW) is secured?

The RSPB notes the Applicant's concern about the potential impacts on the works of allowing the ECOW to suspend construction if there is a risk of significant disturbance to wading birds (para 3). The RSPB understands that the Phillips66 Replacement Pipeline ECOW stopped works once during the entire intertidal working period (*Tetney Sealine Replacement Project, ECW End of Project Report, September 2015 (RPS)*, para 3.9), and consequently considers that the risks arising from conferring this power on the ECOW are unlikely to be realised.

If a general power for the ECOW to stop works during the construction window is not conferred, the RSPB considers that this power should be conferred as part of the end of working window conditions that the Applicant envisages using the tailpiece to DCO Appendix A condition 20(3) for.

Appendix A - Draft Development Consent Order (v5)

The RSPB has already set out a number of concerns in relation to the draft DCO in its submissions at Deadlines 2, 3 and 4. We expand upon those below where relevant. The RSPB has refrained from raising new issues at this stage.

The RSPB notes that the latest version of the Draft DCO contains various amendments to introduce and secure the In Principle Monitoring Plan (IPMP). We welcome those amendments. However, as these amendments do not relate to the contents of the IPMP we make no further comment here, but comment in detail on the IPMP under the heading *Appendix P – In Principle Monitoring Plan* below.

Schedule A

Part 3, Requirement 7 – the RSPB note that the provisions in relation to the Ecological Management Plan are still mute on the issue of monitoring. We highlighted our concern at what we consider to be a serious oversight in our response to Deadline 2 (Question EL14, para 2) and are concerned that this is not addressed (*Schedule of Changes to Version 5 of the draft Development Consent Order, SMartWind, Appendix D, Deadline 4*, lists no changes to this provision). We request that this requirement is included in the text. We have also considered the new IPMP (mentioned above) but note that it does not contain provisions to address this concern. We have proposed suitable monitoring provisions in our response to the draft IPMP below.

Part 3, Requirement 8 – the RSPB note that the provisions in relation to the Code of Construction Practice still make no reference to ecology. We highlighted our concern in our response to Deadline 2 (in our answer to the ExA Question EL14, para 3) and are concerned that the changes to this requirement during the course of the Examination have not included what we consider to be a simple requirement (*Schedule of Changes to Version 5 of the draft Development Consent Order, SMartWind, Appendix D, Deadline 4*, pp19-21). We request that this requirement is included in the text.

The RSPB requested a requirement that the first phase of a multi-phase construction scheme would comprise the installation of all of the ducts (Deadline 2, Appendix 1, para 13). We have been unable to identify the introduction of such a provision in the subsequent revisions to the DCO. We recommend the insertion of the following text between Requirements 8 and 9:

“In the event of a phased installation of the electrical circuits through the intertidal zone all ducting work must be completed during the first phase.”

Part 3, Requirement 27 – the Intertidal Access Management Plan - the RSPB notes that the DCO provisions on the Intertidal Access Management Plan currently make no reference to the construction of ducts or cable laying works (or indeed any construction activities). The text makes clear reference to access onto the intertidal by vehicles, but does not cover the use of construction equipment or the conduct of contractors whilst on the intertidal. We consider that these provisions should be added into the DCO to avoid any future uncertainty.

DML A2 and B2

Condition 10(2)(b) – the RSPB has requested that the provisions on the Code of Construction Practice are modified to either incorporate the detailed construction methods and timings or for it to form part of the DML requirements (the RSPB Written Representations, para 10.10). We note that this provision has not changed (*Schedule of Changes to Version 5 of the draft Development Consent Order, SMartWind, Appendix D, Deadline 4, p87*).

Condition 20(3) – the RSPB has yet to see any evidence presented by the Applicant to indicate that the impacts of operations on the intertidal during the winter period have been assessed. We set out the only instances where information about the winter period was considered in para 3.4.8 of our Deadline 3 submission, all of which highlighted that the decision had been made to exclude work during the winter period but without any actual consideration of activities upon the intertidal area during this time. We note the Applicant’s recent statement of the reason for this provision (addressed in our comments on the ExA Question EL17 above). Consequently the RSPB remains clear in its desire to see the tailpiece of this condition removed. We continue to discuss a suitable alternative approach to this matter which would address the Applicant’s operational concerns.

For the avoidance of doubt the RSPB has no comment on the change of wording from specified months to a reference to “the overwintering period.”

Condition 20(4) – The RSPB notes that as discussed at the ISH on 27 October, the Applicant is working on a new version of this condition which makes changes to the tide height references. Consequently the RSPB will wait for version 6 of the DCO (due at Deadline 5) and will comment upon the revised provision there in time for Deadline 6.

Appendix P - In Principle Monitoring Plan

The RSPB understands that the intention of the In Principle Monitoring Plan (IPMP) is to make a clear statement of all of the monitoring provisions that are to be required of Hornsea Project 2.

This section draws together all of the ornithological monitoring provisions that the Applicant has committed to via the DCO, the Outline Ecological Management Plan (EMP), the Outline Code of Construction Practice (CoCP), the Ornithological Monitoring Plan (OMP) and the draft IPMP. Logically we would expect to see the IPMP reflect all of these and set out a clear monitoring regime for all ornithological impacts. The RSPB has also taken this opportunity to highlight where it would like to see the monitoring provisions improved.

The RSPB notes the following statement from the Applicant:

“The Applicant does not consider it appropriate to define specific monitoring requirements at this stage. The Applicant has committed to ornithological monitoring. It is open minded at this stage as to whether such ornithological monitoring will be best served through site specific monitoring, colony specific monitoring or indeed strategic monitoring. Such decisions are best taken post consent award and following final scheme design.” (The Applicant’s Deadline 2 response, answer to question EOO12, para 2).⁷

The RSPB understands the Applicant’s wishes on this point, but considers that it is essential that the IPMP provides a clear statement of all the areas that need monitoring, and the broad times that they need monitoring (i.e. pre-construction, during construction and post-construction). However, analysis of the documents indicates that this is not the case.

The RSPB notes that the draft In Principle Monitoring Plan currently contains no provisions in relation to intertidal monitoring. The RSPB suggests possible provisions below.

The Outline Code of Construction Practice (CoCP, PINS Doc ref. 12.4) is intended to include

“monitoring procedures for managing the potential environmental impacts of constructing the wind farm and limiting disturbance from construction activities as far as reasonably practicable.” (para 1.2.1)

Despite this, the RSPB notes that the CoCP includes no reference to monitoring of offshore or intertidal ornithological impacts either pre, during or post construction.⁸ Instead it requires the Ecological Management Plan to include monitoring and reporting requirements (para 2.5.2). Similarly, the CoCP requirement in the DCO (Schedule A, requirement 8) contains no reference to the monitoring of environmental impacts.

The RSPB appreciates the Applicant’s desire for flexibility in monitoring, but considers that at present the general requirements are not sufficient. If these are properly established now the RSPB consider that the best ways to effectively monitor these requirements can be left to post-consent discussions.

⁷ The RSPB notes that this is addressed to offshore ornithology, but fully expect that the applicant would hold a similar view in relation to developing the monitoring for the intertidal regime.

⁸ See paragraphs 4.2.130 to 4.2.134 and 4.3.22 to 4.3.27 of the CoCP.

Offshore

The requirements of NPS EN-3, para 2.6.51:

“Owing to the relatively new and complex nature of offshore wind development, the IPC should consider requiring the applicant to undertake monitoring prior to and during construction and during its operation to measure and document the effects of the development. This enables an assessment of the accuracy of the original predictions and may inform the scope of future EIAs.”

This prompted the RSPB’s observation in response to the ExA Question EOO20 that

“data collection during construction is also helpful to identify whether construction per se is the cause of observed changes and whether effects persist during the operational phase.”

In our answer to question EOO20 the RSPB highlighted:

“The current lack of empirical evidence on the scale of impact on bird populations from offshore wind farms means the high levels of uncertainty in the conclusion of predicted population level impacts used for the decision making process remain. Post consent monitoring will help address and reduce these uncertainties for future deployment of offshore renewables.”

However, to achieve this reduction in uncertainty requires that the monitoring programme is sufficient. Having considered the various documents the RSPB is concerned that they do not currently provide sufficient information to move towards this goal.

Enhancement, Mitigation and Monitoring Commitments (version 3) (The Applicant’s Deadline 4, Appendix N) requires monitoring

“in accordance with an ornithological monitoring plan setting out the circumstances in which ornithological monitoring will be required and the monitoring to be carried out in such circumstances.”⁹

The RSPB highlighted that Condition 10(2)(k) does not adequately secure a monitoring regime in our answer to question EOO19. The RSPB notes that the In Principle Monitoring Plan explains the future role of the Ornithological Monitoring Plan required in the DCO (the Applicant’s Deadline 4, Appendix P):

“The condition has been purposefully kept flexible at this stage in recognition that the monitoring that is undertaken should not be specified at this stage. The options that are likely to be considered during the drafting of the OMP (post consent) will include site specific

⁹ The requirements are contained in DML A1 and B2, condition 10(2)(k) (for the monitoring plan) and 15(2)(b) (for pre-construction impacts) and 17(2)(a) (for post-construction impacts).

studies (including standardised pre and post construction surveys), colony specific studies and or contributions to more industry wide strategic work.

The form and nature of the monitoring that is recommended within the OMP will be based on the final form the consent, the final project design, the current industry knowledge/knowledge gaps relevant to those effects predicted for Hornsea Project 2 (and the key receptors/risks as identified within this IPMP) at the time of drafting the OMP.” (page 33)

The aim of any monitoring would be:

“To establish a baseline to test key predictions or address specific areas of uncertainty relating to key receptors as identified in the ES and HRA (and summarised within this IPMP).” (p34)

The RSPB recommended monitoring to input into strategic level (e.g. biogeographic, regional or country level) monitoring that is urgently required (as recognised by NPS EN 3, set out above) as well as specific project level monitoring, whilst noting that there is likely to be a significant overlap between these two requirements (see the RSPB’s answer to the ExA Question EOO20, Deadline 4). Associated with this would be 2 main tasks – surveillance (to observe and react to population scale impacts) and targeted monitoring (aimed at investigating focussed questions, understanding impacts and their mitigation and informing future planning) (the RSPB, *answer to the ExA EOO20*, Deadline 4).

At the strategic level this monitoring would cover collision impacts (through annual colony counts, and regular abundance estimates through the breeding season) and displacement (which would identify poorer foraging success and reduced breeding productivity via reduced clutch sizes and/or fledging success). At the project level the RSPB noted that this monitoring may require novel approaches which were likely to require testing and validation (See the RSPB answer to *the ExA question EOO20*, Deadline 4).

Pre-construction monitoring

Survey proposals must be in general accordance with the principles set out in the IPMP (DCO v5, and Schedules H&J DMLs A1 & B1, part 2, condition 15(1)(a)). The RSPB notes that there is a requirement for monitoring in accordance with an OMP (condition 15(2)(b)). However, as highlighted above, no detail currently exists about what should be covered, and the OMP will not be drawn up until after a consent has been granted. We recommend that baseline populations for the following species are established: kittiwake, gannet, guillemot, razorbill and puffin.

Construction monitoring

Survey proposals must be in general accordance with the principles set out in the IPMP (DCO v5, and Schedules H&J DMLs A1 & B1, part 2, condition 16(1)). However, the RSPB notes that there is no specific requirement for the monitoring of construction impacts on ornithological features within condition 16.

In our answer to the ExA question EOO19 the RSPB requested that the ExA should consider requiring the Applicant to undertake monitoring during construction in order to measure and document the effects of the development, reflecting the requirements of NPS EN-3, para 2.6.51:

“data collection during construction is also helpful to identify whether construction per se is the cause of observed changes and whether effects persist during the operational phase.”
(EOO20)

The RSPB would be grateful to discuss this with the Applicant post-consent.

Post-construction monitoring

Survey proposals must be in general accordance with the principles set out in the IPMP (DCO v5, and Schedules H&J DMLs A1 & B1, part 2, condition 17(1)). Surveys will include any ornithological monitoring required by the OMP (DCO v5, and Schedules H&J -DMLs A1 & B1, part 2, condition 17(2)(a)). The RSPB notes that the OMP will set out the circumstances in which ornithological monitoring will be required and the monitoring to be carried out (DCO v5, and Schedules H&J DMLs A1 & B1, part 2, condition 10(2)(k)). However, as highlighted above, no detail currently exists about what should be covered, and the OMP will not be drawn up until after a consent has been granted.

In our answer to the ExA Question EOO20 the RSPB identified two key points in relation to post construction surveys: The need to be of sufficient duration to permit the distinction between short-term and longer-term effects attributable to the presence of the wind farm, and the importance of reviews at pre-determined time intervals to enable decisions to be taken with respect to any necessary refinements of the survey methods.

The RSPB notes Natural England’s detailed response to the ExA’s question EOO20 (NE, *Written Submission for Deadline 4*, Section C). This picks up on post-consent monitoring. Of particular note is the third bullet point¹⁰, which highlights the importance of

“ensuring that data on the numbers of birds using the site ... are collected in a manner that allows adequate statistical comparisons to be made between baseline, during construction and post construction periods”.

The RSPB supports this comment.

Intertidal

The RSPB notes that provision for monitoring of ornithological impacts in the intertidal is particularly poor. The OMP does not cover the intertidal at all, and as highlighted above, the IPMP also makes no reference to the intertidal. Consequently, the RSPB recommends some additional provisions to address this below.

¹⁰ Taken from the MMO report *Review of post-consent offshore wind farm monitoring data associated with licence conditions. A report produced for the Marine Management Organisation*, p194. MMO Project No: 1031. ISBN: 978-1-909452-24-4 (2014).

In addition the RSPB has previously flagged up concerns with both the Outline EMP and the Outline CoCP:

“the limited scope of the Outline EMP in relation to bird impacts arising from the intertidal work as well as the EMP not including monitoring requirements for possible ornithological impacts on the intertidal zone mean we remain concerned. The RSPB considers that this needs to be addressed, and we will discuss with the Applicants what appropriate measures could be included as well as our further concerns set out above in answer to CL26.”
(paragraph b of RSPB’s answer to question DC33)

“At present due to the limited scope of the Outline CoCP in relation to bird impacts arising from the intertidal work, it does not propose to monitor ornithological impacts on the intertidal zone. The RSPB consider that this needs to be addressed, and we would welcome working with the Applicant in order to suggest appropriate monitoring measures.”
(paragraph b of RSPB’s answer to question DC34)

The RSPB notes Natural England’s response to the ExA Question DC33, particularly the statement

“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 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.”

The RSPB also notes Natural England and the MMO’s responses to the ExA Questions DC33 (Ecological Management Plan) and DC34 (Code of Construction Practice). Despite Natural England and the MMO’s satisfaction with both of these documents the RSPB continues to have outstanding concerns, as set out in our answers to these questions. We do not consider that the answers by Natural England and the MMO alter our concerns.

Pre-construction monitoring

Survey proposals must be in general accordance with the principles set out in the IPMP (DCO v5, Schedules I&K – DMLs A2 and B2, condition 15(1)(a)).

The RSPB notes that pre-construction survey requirements within the Outline EMP do not make any reference to intertidal birds (Doc Ref. 12.5, para 8.2.2.).

The RSPB notes that Table 1.13, *Intertidal Ornithology*, in *Enhancement, Mitigation and Monitoring Commitment* (version 3) (the Applicant’s Deadline 4, Appendix N) states that

“Pre-construction surveys of the intertidal area will be carried out to identify potential changes in baseline conditions.” (Ref. 188),

which it describes as a DCO requirement (Schedule A, requirement 7 – Ecological Management Plan), but the RSPB has been unable to identify any ornithological monitoring provisions within this DCO requirement.

Construction monitoring

Survey proposals must be in general accordance with the principles set out in the IPMP (DCO v5, Schedules I&K – DMLs A2 and B2, condition 16(1)).

The RSPB notes that the Outline EMP highlights

“The population of wintering and migratory birds utilising the intertidal zone adjacent to the landfall are considered due to their relationship with the land and proximity to onshore working areas.” (Doc ref. 12.5, para 2.3.4)

Despite the acknowledged proximity the RSPB is disappointed to note that no construction monitoring is currently proposed.

The Outline EMP notes that the works will be overseen by the Ecological Clerk of Works (ECoW) and that an ecological watching brief will be provided by the ECoW or an appropriately experienced ecologist pre-approved by the ECoW (Doc ref. 12.5, para 5.3.8). The RSPB has recommended that the role of the ECoW should be expanded – and that this should involve the monitoring of disturbance (Summary of RSPB’s Oral Case, Deadline 3, para 3.4.10)¹¹ and in our comments on the Applicant’s response to question CL26 above.

Given that the Outline EMP envisages that

“A separate report of ecology and nature conservation measures undertaken at the landfall and in the intertidal zone will be produced by the ECoW and provided to the Developer, NE, The EA and the LPAs as soon as practicable” (Doc ref. 12.5, para 8.2.6)

the RSPB consider that there is no logical impediment to reporting on disturbance instances during the construction works.

The RSPB highlighted that the Phillips 66 conditions required “Monitoring the use of the project area by roosting, feeding and breeding birds during construction” (The RSPB’s answer to the ExA questions CL26, Deadline 4).

¹¹ The RSPB suggested this as part of the Clerk’s “watching brief”, with a view to the Clerk being empowered to stop work if disturbance was likely. However, the RSPB considers that even without a power to stop work that the recoding of flushing of birds from the intertidal would be useful.

Post-construction monitoring

Survey proposals must be in general accordance with the principles set out in the IPMP plan (DCO v5, Schedules I&K – DMLs A2 and B2, condition 17(1)).

The RSPB notes that the Outline EMP (Doc Ref. 12.5) does not contain any references to post-construction ornithological monitoring.

The RSPB is disappointed to note that although the IPMP contains references to monitoring of offshore ornithology, the IPMP is mute on the subject of intertidal ornithology. We consider that it will be essential to monitor the impacts of the ducting and cable laying operations in the intertidal area. To address this we provide a suggested intertidal ornithology monitoring regime, presented in the same format as the monitoring regimes within the IPMP. We have suggested an approach which should be straightforward for the Applicant to deliver, and would be happy to discuss the best ways to deliver these monitoring requirements with the Applicant.

Table: RSPB suggested intertidal ornithology monitoring regime

Potential effect	Receptor(s)	Monitoring approach	Monitoring objectives	Agreed	DCO ref.	Links to other monitoring
<i>Pre-construction monitoring</i>						
Disturbance to intertidal birds	Wading birds: Bar-tailed Godwit; Common Tern; Dunlin; Golden Plover; Grey Plover; Knot; Oystercatcher; Ringed Plover; Sanderling	The monitoring should establish up-to-date baselines of usage and susceptibility to flushing of the birds utilising the intertidal zone.	To establish a baseline to test key predictions or address specific areas of uncertainty relating to key receptors as identified in the ES and HRA			This requirement should be included in both the IPMP and the EMP.
<i>Construction monitoring</i>						
Disturbance to intertidal birds	Wading birds: Bar-tailed Godwit; Common Tern; Dunlin; Golden Plover; Grey Plover; Knot; Oystercatcher; Ringed Plover; Sanderling	Ecological Clerk of Works to record when birds are flushed. ¹²	To establish the extent to which construction activity has, or has not, impacted upon the roosting of wading			This requirement should be included in both the IPMP and the EMP.

¹² This reflects the RSPB’s position set out in para 2 of our answer to the ExA Question EL10 (Deadline 2) that the Ecological Clerk of Works for the Phillips66 Replacement Pipeline was required to monitor the presence and any disturbance of wading birds.

			birds.			
<i>Post-construction monitoring</i>						
Disturbance to intertidal birds	Wading birds: Bar-tailed Godwit; Common Tern; Dunlin; Golden Plover; Grey Plover; Knot; Oystercatcher; Ringed Plover; Sanderling	The monitoring should establish the post-construction levels of usage of the intertidal zone.	To establish whether bird species are using the intertidal zone to the same extent identified in the baseline monitoring.			This requirement should be included in both the IPMP and the EMP.

General comments on the IPMP

In terms of document structure we recommend that the Applicant changes the running order of sections, placing section 4 (In Principle Proposals for Monitoring) ahead of the present section 3 (Overview of Monitoring Conditions Set Out In The DCO) as it aids the overall readability of the document, going from the principles to the areas of monitoring to the detailed provisions by which the monitoring is required.

Appendix R - Intertidal Clarification Note (produced for NE)

In para 5.1.4 of Appendix R, the Applicant noted that NE had raised concerns of likely significant effects on birds if maintenance visits lasted two to three weeks. If such maintenance visits are to be routine, the RSPB suggests that they should be scheduled during June and July when disturbance of SPA birds is least likely. If maintenance work have to be carried out during October to March then the RSPB agrees with the suggested conditions 6 a-c and 7 set out in para 5.3.1 of Appendix R.

The RSPB has noted a number of references to the future Intertidal Access Management Plan within this Appendix¹³. We have considered all of these. The only paragraph which provides some indication of what detail it sis likely to contain is para 2.3.3 (reproduced here for ease of reference) which states:

“The detail contained in the Intertidal Access Management Plan will make reference back to the ES and HRA to clearly demonstrate that the final proposed methods result in no greater impacts than those assessed under the worst case scenario as presented within these documents (i.e., they fell within the consented envelope).”

However, as set out above, the RSPB does not consider that this provides sufficient information for us to comment on whether the plan, once drafted will address our concerns.

¹³ At paragraphs 2.2.5, 2.2.14, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 3.2.5, 3.3.1, 4.2.1, and 4.2.2, and Appendix A (to Appendix R) para 2.2.1 and 2.2.2.

Appendix BB - HRA Screening and Integrity Matrices

The RSPB has limited its consideration to the following sites: Flamborough Head and Bempton Cliffs SPA, Flamborough and Filey Coast pSPA, the proposed Greater Wash SPA and the Humber SPA.

Possible Greater Wash SPA

The RSPB note that the screening and integrity matrix *Habitats Regulations Assessment Screening and Integrity Matrices (Version 3)*¹⁴ only considers displacement for the operational phase of Hornsea Project 2. The RSPB's concerns relate to the impacts of cable laying during the construction stage as well as vessels passing through the proposed SPA during all three phases of the scheme.

Although disturbance is considered for all three phases (construction, operation and decommissioning) the matrix only considers minimal disturbance is anticipated on the features, provided best practice measures and protocols are implemented to reduce disturbance to birds associated with vessel transit. However, the bird surveys undertaken to inform the boundaries of the proposed SPA have shown red-throated divers in the area between the cable landfall and the Project 2 wind farm area.

Impacts from the Horns Rev offshore wind farm (see our response to Appendix FF below for more details) show that there was a 66% reduction in red-throated divers post construction. The Applicant has provided no information about the number of divers using this area. The creation of a new regular vessel/helicopter route to Project 2 could prevent divers (or common scoter) from utilising this area of sea during the lifetime of the wind farm. The RSPB considers that best practice and protocols will not work unless all journeys are undertaken during the summer period when divers would not be present: the RSPB fully understands that such a constraint on the construction, operation and decommissioning of Project 2 is unlikely to be practicable, and consequently we do not consider that the Applicant can rely on this approach to conclude that there will be no likely significant effect.

The RSPB also note that in combination effects have been dismissed. For the reasons set out in the paragraph above, the RSPB considers that there is a clear mechanism for disturbance and displacement with new associated vessel and helicopter movements. The RSPB also considers that consequently there are likely to be in combination effects with other plans or projects.

Humber SPA

The RSPB has no comments to make on the information set out in the Humber SPA entry.

Appendix FF – Possible Greater Wash SPA Shadow HRA Screening

At the Issue Specific Hearing on 27 October the RSPB had not been shown any information on the distribution and numbers of birds within the Greater Wash pSPA. Since that Hearing we have seen the data on which the pSPA is proposed and concur that Red-throated Divers appear to be the key issue.

¹⁴ Appendix BB to the Applicant's response submitted for Deadline IV.

In para 1.4.9 the Applicant states that their boat-based surveys of subzone 2 plus 4km buffer only recorded red-throated divers in “very low numbers”. But aerial surveys are the preferred method for counting sea birds, particularly where species are prone to disturbance by boats. The RSPB would welcome clarity from the Applicant whether the whole cable route across the pSPA was covered by its boat based surveys. If this is not the case then the RSPB respectfully contends that the findings of the boat based surveys cited by the Applicant are of no assistance to understanding the likely impacts of the cable laying works.

In the hearing we quoted Petersen et al (2005) regarding Horns Rev windfarm where a 66% reduction in red-throated divers was noted post construction out to 4km of the wind farm footprint. We were therefore concerned about boat traffic within 4km of project related activity. This was contested in the hearing by Dr Norman who said it was the turbines, not the boats that had displaced the divers. This is what Petersen et al concluded:

The reason for the change in avoidance of the wind farm area for divers, Common Scoter and Guillemot/Razorbill is unknown. Disturbance effects from the wind turbines are one possible reason. Disturbance from increased human activity associated with maintenance of the wind turbines could be another. However, changes in the distribution of food resources in the study area could potentially play a role too.

On the basis of Peterson et al’s conclusion we consider that all activity associated with the wind farm will need to be taken into consideration.

Appendix FF, para 1.5.5 suggests that cable laying disturbance will be limited to the immediate vicinity of where work is being carried out. But if red-throated divers are displaced by boats to a distance of 4km, the area of disturbance will be 50 square km (or 5,000 hectares) from a point source of disturbance (i.e. a boat)¹⁵.

Evidence suggests that vessel disturbance cannot be dismissed as a reason for the change in diver density at Horns Rev, so the RSPB continues to be concerned by the increases in vessel traffic resulting from both cable laying and maintenance trips for Hornsea Project 2. Further, Furness et al 2013 (Furness, Robert W., Helen M. Wade, and Elizabeth A. Masden. "Assessing vulnerability of marine bird populations to offshore wind farms." *Journal of environmental management* 119 (2013): 56-66), ranked red-throated diver highest in terms of susceptibility to disturbance by ship and helicopter traffic.

Para 1.5.6 states that there will be an 8.1% increase in constructional traffic during the construction and decommission phase and a 22% increase during the operational phase (para 1.5.13). No context is provided for these figures. For example will these increases be within the pSPA as a whole, or an increase in Humber-based traffic. Of more interest would be the proposed location of these additional boat movements in relation to existing boat movements. SPA birds are likely to avoid pre-existing vessel routes by relocating to undisturbed areas of the pSPA and therefore if new regular vessel routes are to be established, this could result in large areas (4km either side of the vessel routes) of the pSPA being unusable by red-throated divers.

¹⁵ The 50km² is the area of a circle with a 4km radius.

So it is the location of vessel movements rather than increase in volume that is critical. The RSPB has attempted to identify the shortest and longest possible routes across the possible Greater Wash SPA from the seaward boundary of the Humber Estuary SPA. The route appears to traverse nearly 50km of pSPA, and using an 8km corridor (4km either side of the cable) this would affect an area in excess of 300 square km where red-throated divers might not be able to utilise the pSPA as freely as if Project 2 had not gone ahead..¹⁶

Regular helicopter routes may cause similar disturbance and displacement (para 1.5.12).

The RSPB therefore disagrees with the Applicant's conclusions in para 1.5.15. If regular vessel and helicopter traffic results in red-throated divers being displaced from parts of the pSPA that they might otherwise have occupied, then likely significant effects on this species will occur.

The RSPB also disagrees with the Applicant's conclusions in para 1.5.18 for the reasons given above. We believe that connectivity is irrelevant. It is the fact that regular vessel and helicopter traffic might result in red-throated divers being displaced from parts of the pSPA that they might otherwise have occupied.

Finally, the RSPB disagrees with the conclusions drawn in para 1.6.1. We believe that it cannot be ascertained that increased vessel and helicopter activity associated with both construction and operational phases of Hornsea Project 2, will not result in displacement of red-throated divers from parts of the pSPA that they might otherwise have occupied.

¹⁶ It is important to note that these figures are estimates due to the limited information currently available relating to the possible boundary of the site.

Appendix to the RSPB Deadline 5 Response

The RSPB's comments on Furness (2015) *Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS)*

The BDMPS report by Furness (2015), commissioned by Natural England has been relied upon by the Applicant in several of their submissions¹⁷ and was subject to a question from the Examining Authority at the second Issue Specific Hearing. The purpose of this note is to clarify the purpose and methodology of that report, and to summarise the conclusions presented for kittiwake.

Purpose of the report

The aim of the research was to review and define non-breeding season seabird populations at biologically defined minimum population scales (BDMPS) for species commonly wintering or passing through UK waters (in other words the project sets out to describe the biogeographic seabird populations with connectivity to UK waters). Biogeographical scale, the largest and easiest to define, is so large it is impractical to assess cumulative effect. As a first step, we require population estimates, at an agreed scale, for key seabird species (those most likely to be affected by development) occurring in UK waters in the non-breeding season. These then need to be adjusted to take account of immature birds present since those can form a high proportion of the population in species with deferred maturity. The primary goal was to enable the apportioning of potential impacts of marine renewable developments during the non-breeding season. The report also provides a useful summary of information related to seasonality and passage periods.

The main application of this work is expected to be with respect to collision risk modelling for offshore wind farms. It is fully anticipated that the report will have a finite lifespan as more information on population sizes, distributions and demographics becomes available, but the methods described therein can be repeated to generate more precise estimates of BDMPS and the literature reviews will remain useful sources of information.

Description of methodology

In order to define the BDMPS, information is needed on a range of traits including: population sizes and age structure, migratory movements and phenology.

1. Data on the demography of seabirds (survival rates, age of first breeding, productivity) is used to model population age structure (using simple Leslie matrices model assuming stable population size) in order to assess the numbers of immature birds that are associated with breeding populations, and therefore the proportion of non-breeding birds present in the population as a whole.
2. Data on the timing of breeding and of migration are used to assess the appropriate seasonal definitions. Modal (mean) definitions of breeding seasons are used (in most cases these are given in whole months) since much variability exists in terms of arrival and departure times of individual birds from colonies as well as between year variance.
3. Migratory movements are reviewed based on literature and a variety of other data sources.

¹⁷ (Deadline 1 – main response & Appendix M, Deadline 2 – Appendix I, Deadline 2A – Appendices N, O, P, Q, R, Deadline 3 – Appendices J & Y, Deadline 4 – Appendices CC, DD & EE)

4. Numbers thought to be present in UK waters were reviewed from literature sources.
5. Numbers of breeding pairs in UK Special Protection Area (SPA) breeding populations are tabulated for each species.
6. Hierarchical scales are presented that may be of use in assessment of impacts on populations:
 - i. biogeographic population with connectivity to UK waters;
 - ii. total number of birds present in all UK territorial waters during the defined season¹⁸; and
 - iii. total number of birds in each spatially distinct biologically defined minimum population scales (BDMPS) during that defined season.

BDMPS population sizes were estimated from the information on migrations of each population, and the most up to date data were used in an apportioning of birds from each population into each BDMPS.

Confidence in the assessments of BDMPS population sizes was expressed using a traffic light coding:

- Green = actual population size no more than 30% less or 50% more than the estimated number
- Amber = actual population size no more than 50% less or 80% more than the estimated number
- Red = actual population size more than 50% below, or 80% above, the estimate presented

The intention is that the apportioning tables (Appendix A) can be updated as new data becomes available on censuses, migrations and winter distribution that allow more precise and accurate quantifications of proportions of populations present.

Calculation of number of immature birds in population

Where data on juvenile survival was missing this parameter was adjusted within the Leslie matrix until the growth rate was zero. This approach is assumed to be precautionary. It was also assumed that all individuals of breeding age breed every year (without sabbaticals).

Note on the methodology/results

The report generally relies on BTO Bird facts for demographic data. However, the report was finished and released prior to the publication of Horswill & Robinson (2015)¹⁹, which comprehensively reviewed demographic rates for UK seabirds. There are a number of discrepancies in terms of adult survival, productivity and age of first breeding, between the two reports (see table on page '1' of Furness (2015) and Horswill & Robinson (2015) p. 73/74 which includes for example adult survival/productivity of Herring gull as 0.880/0.936 in Furness (2015) and 0.834/0.920 in Horswill & Robinson (2015)). Thus the non-breeding component of the population might be considerably different to that modelled by Furness (2015).

However this report contains a lot of useful information and methods. As mentioned above, aspects of this analysis will quickly become obsolete and to an extent this has already happened, however, the methodology and literature review will remain useful for some time to come.

¹⁸ This is the sum of the UK breeding population and those birds known to visit UK waters (during migration or overwintering).

¹⁹ Horswill, C. & Robinson R. A. 2015. *Review of seabird demographic rates and density dependence*. JNCC Report No. 552. Joint Nature Conservation Committee, Peterborough

Kittiwake summary

The report shows there is considerable uncertainty about kittiwake movement patterns, and evidence that these show high variability. The report also argues there is considerable uncertainty about very recent changes in kittiwake population sizes, particularly for overseas populations. As such overall, numbers from UK in BDMPS are coded amber (no more than 50% less or 80% more than the estimated number), and numbers from overseas are coded red (the true value may lie more than 50% below, or 80% above, the estimate presented), and the total numbers in BDMPS were also coded red (page 157).

The report contains a carefully defined breeding season for kittiwake: March-August with the corresponding non-breeding season beginning September-February. The report acknowledges that there will be overlap between seasons and outlines the following definitions (in 15.4):

- UK Breeding season March-August
 - Migration-free breeding season May-July
- Non-breeding season September-February
 - Post-breeding migration in UK waters August-December (**autumn BDMPS**)
 - Return migration through UK waters January-April (**spring BDMPS**)

Figure 15.4-15.7 show from the best available evidence, the kittiwake breeding population trends in the whole UK, and in Scotland, England and Wales. All of these show a strong decline.

Table 15.1 on page 168, presents data from all 33 of the UK SPAs for which kittiwake is a designated feature, including a column on “Site Conditioning Monitoring”. This column refers to information on key protected areas provided by Scottish Natural Heritage on their website²⁰. As such it only refers to Scottish sites, and spaces in the column are left blank only in reference to sites outwith Scotland. **This does not infer any judgement on the status of the population, or degree of uncertainty around it.** However a thorough assessment of site condition for the SPA and pSPA has been provided separately as part of the Hornsea Project 2 Written Submissions from Natural England, under Deadline 4, which demonstrates that the kittiwake population at the SPA declined from 1986 to 2008 in line with the national population trends. These are also presented in Furness (2015).

²⁰ <http://gateway.snh.gov.uk/sitelink/index.jsp>

The RSPB's comments on Cleasby et al 2015 *Three-dimensional tracking of a wide-ranging marine predator: flight heights and vulnerability to offshore wind farms*, Journal of Applied Ecology 2015, DOI: 1111/1365-2664.12529

As set out above in the RSPB's main submission, views on the gannet tracking paper were requested by the Examining Authority during the last ISH under Agenda item 8.5. Further to the RSPB's brief comments made during the Issue Specific Hearing (as set out in the Oral Summary of our submissions at that Hearing above) below are the RSPB's more detailed comments on Cleasby et al.

Summary of paper

This paper reports a tracking study of 55 adult, chick-rearing gannets from the Bass Rock, over three years, 2010 - 2012. Most of the individual birds were studied in more than one year. The study used a combination of GPS data loggers, fitted to all individuals and barometric pressure loggers, fitted to 11 birds in 2011 and 5 in 2012, a total of 15 individuals (one bird was tagged in both years). The GPS loggers provided accurate measurements of location while the pressure loggers facilitated accurate measurements of flight height.

Validation of flight height measurements from the pressure loggers was carried with loggers placed at different known elevations; frequent measurements were also taken at ground level in the Bass Rock colony. The mean absolute error of height measured by recording pressure was 0.88m (0.32 - 1.92m).

High resolution tracking data were used to examine flight heights during commuting and foraging, and standard resolution data to examine spatial variation in flight height (high resolution data were more precise but included incomplete trips which could have been a source of bias).

Variability in the probability of a bird flying at collision-risk height, taken to be 30-160m, for a generalised wind turbine was examined in the context of flight type, location and individual bird ID. The Band Collision Risk Model (CRM) (2012) was then used to estimate collision risk for two of the Firth of Forth proposed offshore wind farm sites (Near na Gaoithe and Inch Cape, in Scottish Territorial Waters). Their aim was to investigate the importance of accurate flight-height assessments for collision risk modelling. Both the basic and extended versions of the CRM were used, with avoidance rates of 99% and 98.5% respectively, and collision risk estimates were adjusted by 82% to account for the fact that birds do not fly continuously at sea. For comparison the CRM was run using published estimates of gannet flight heights estimated subjectively by observers, from Cook et al. (2012) for the basic model and Johnston et al. (2014) for the extended model.

Recorded foraging ranges extended up to 536.5km (mean \pm Standard Deviation, 180.9 ± 106.0 km; 516 foraging trips by 55 individuals). Commuting flights were at lower elevation (median = 11.6 metres, number of flights=738) than foraging flights (median = 26.5m, number of flights=464), with foraging flights at collision risk height.

There was significant spatial variation in flight heights of gannets, and in the probability of flying at collision risk height. Areas of high average flight height were all more than 100km from the breeding colony, with lower average heights occurring mainly, but not entirely, inshore and closer to the colony. There was also significant variation in flight height among individuals and in the probability of flying at collision risk height.

Collision mortality predicted using GPS and altimeter data was 11.6 and 5.9 times greater, respectively for extended and basic CRM than using existing data. The authors quote their CRM estimate of approximately 300 breeding adult gannets in each month of the chick-rearing period (mid-April to mid-September) in each year, using the basic CRM and 99% avoidance rate, leading to a predicted cumulative breeding season collision mortality of approximately 1,500 gannets *pa*. They also refer to the gannet population simulation model (WWT Consulting et al. 2012²¹) which indicated that, for a Bass Rock population of 48,000 gannets in 2004, mortality of 2,000 gannets *pa* (estimated to comprise 1,400 adults and 600 immature birds) would be sufficient to cause a sustained decrease in the overall breeding population size. Despite the increasing population at Bass Rock, the authors still considered that their conservative mortality estimate is sufficiently high to be of concern for the overall breeding population, for various reasons:

1. their estimate is for just two of the Firth of Forth proposed wind farms and takes no account of mortality at other wind farms;
2. their estimate does not take account of mortality from other causes;
3. they assume a lower blade sweep of 30m, but it can be as low as 22m; and
4. gannets can be based at the colony for up to 9 months of the year, not just the 5 months allocated to the breeding season.

Comments

This is an important study, and is the first time a detailed collision analysis has been based on measured flight heights, rather than those derived typically from estimates of height by boat based observers. It highlights a discrepancy between collision mortality estimates derived from these means. A far higher level of confidence can be ascribed to the measured heights presented in the paper than those estimated by observers, although these only represent a relatively small sample of birds (15). However the large number of actual measurements obtained from these birds, during 738 commuting bouts and 463 foraging bouts, increases confidence in the results.

The discrepancy between estimated and measured heights is rather striking. It may be that it is simply a function of the sample size, but the scale of the discrepancy is so large that this seems unlikely. Two other possible explanations are:

- It is due to attraction of the birds to survey boats, as birds such as gannets and gulls (including kittiwake) will follow boats searching for bi-catch from fishing vessels. As such they will fly lower in the presence of boats, and so would be recorded at lower flight heights during boat based survey; or
- There is a systematic bias in boat based surveys; in other words observers consistently underestimate the altitude of flying birds; or
- Or it could be a combination of both.

A previous study, Garthe et al. (2014), also deployed custom built altimeters to record flight height of foraging gannets in Canadian waters. From a sample of seven breeding adults, 36,389

²¹ WWT Consulting (2012) *Gannet Population Viability Analysis: demographic data, population model and outputs*. SOSS Report 04. Wildfowl & Wetlands Trust, Slimbridge.

measurements of flight height during foraging gave a median flight height of 37m. There are other studies where flight height of gannets has been measured, although these are less clear as there may have associated recording bias. For example Mendel et al. (2014) used laser rangefinders in the German North Sea and from a sample of 24 gannets gave a median flight height estimated at 19m, with about 25% at collision risk height (CRH). However observers had to visually select birds to track, so there may be some selective bias. Radar studies based on tracks of 143 birds suggest that 44% of gannet flight occurs at CRH (Krijgsveld et al. 2005). Further work, although with no sample size presented, indicated 30% of birds at flew at potential CRH (Krijgsveld et al. 2011). It has been argued that radar may bias estimates of flight height because birds flying close to the sea surface cannot be detected by radar due to wave clutter (which is unwanted radar return signals from wave crests). However this will be less of an issue with birds of the size and flight profile (i.e. they tend to fly at a higher height than that associated with this wave clutter) of gannets.

In the context of these studies, and in the near certain knowledge that these measured flight heights are more accurate than previous boat based estimates, it is unlikely that the recorded heights, and consequent greater number of birds at potential collision height (PCH), are simply an artefact of sample size. As such, gannet collision estimates based on height derived from boat surveys are likely to seriously underestimate collision risk. Furthermore, as this underestimation will likely to be due to either attraction to boats or systematic error (or indeed both), this underestimation is also applicable to gull species, including kittiwake. The error through underestimation will apply across sites, so will have important implication for in-combination assessment.

Finally, an important conclusion of this paper is the differentiation of flight height and consequent collision risk into flight behaviours, commuting and foraging, and that foraging flights are more likely to occur further offshore. This suggests that the greatest collision risk is at those sites that are relatively far offshore, but within the foraging range of breeding colonies.

The Applicant's Further Information Submitted for Deadline 4

Please note that comments are not included on some of the new material submitted by the Applicant at Deadline 4. We refer you to our covering email for this Deadline 5 response and wish to repeat that we have not included commentary on areas that may change in light of new information being submitted today by the Applicant but reserve the right to comment on those areas once we have had a chance to review our position in light of the new submissions being made today by the Applicant.

Due to the possible implications of the Applicant's new information it may be necessary to discuss this with the Applicant and Natural England and request further clarification and information, as well as taking into account what this new information means for the RSPB's position as partially set out in this response and more fully in our last submission for Deadline 4.