



Hornsea Project Four

Applicant's comments on other submissions
received at Deadline 1

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Revision Summary

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1 Introduction

1.1.1.1 In line with the Rule 8 Letter ([PD-007](#)) and Examination Timetable outlined in Annex A of [PD-007](#), stakeholders are invited to submit comments in relation to the submitted application documents and proposed project. At Deadline 1 the following submissions were received:

- East Riding of Yorkshire Council - Additional information to accompany Local Impact Report (LIR) ([REP1-072](#));
- East Riding of Yorkshire Council - Submission of suggested sites for the ExA to visit on either an unaccompanied basis or as part of an Accompanied Site Inspection (ASI), if one is required ([REP1-073](#));
- East Riding of Yorkshire Council – Local Impact Reports (LIRs) from local authorities ([REP1-074](#));
- Lockington Parish Council - Deadline 1 Submission ([REP1-075](#));
- Marine Management Organisation - Deadline 1 Submission - Written representation, Comments on Relevant Representations, Initial Statements of Common Ground (SoCG), Comments on revised documents ([REP1-076](#));
- Max Rowe on behalf of Harbour Energy Deadline 1 Submission - Clarification of interested party; Notification of wish to have future correspondence received electronically; Preliminary response to Examining Authority's written questions and requests for information (ExQ1); ([REP1-077](#));
- National Grid Carbon - Text for inclusion in Initial Statements of Common Ground (SoCGs) requested by the Examining Authority ([REP1-078](#));
- National Grid Carbon Limited - Information to accompany text for inclusion in Initial Statements of Common Ground (SoCGs) requested by the Examining Authority ([REP1-079](#));
- Outer Dowsing Offshore Wind Ltd -Deadline 1 Submission – Accepted at the discretion of the Examining Authority ([REP1-081](#)); and
- The Wildlife Trusts – Deadline 1 Submission – Response to Examination Authority's written questions and requests for information (ExQ1) ([REP1-082](#)).

1.1.1.2 The Applicant has reviewed and noted the content of all submissions and with this document provides comments on specific topics raised. The Applicant has responded to the submission made by the Marine Management Organisation ([REP1-076](#)) in Section 2.

1.1.1.3 A glossary of terms can be found in [G1.45: Overarching Glossary \(REP1-067\)](#) and an acronyms list can be found in [G1.1: Overarching Acronyms List \(REP1-037\)](#).

2 Applicant's Comments to Marine Management Organisation's submission (REP1-076).

Reference	Stakeholder's Written Representation	Applicant's Response
MMO-REP1-076-SUM	<p><u>Deadline 1 Submission</u></p> <p>On 4 November 2021, the Marine Management Organisation (the "MMO") received notice under Section 56 of the Planning Act 2008 (the "PA 2008") that the Planning Inspectorate ("PINS") had accepted an application made by Orsted Hornsea Project Four (UK) Ltd (the "Applicant") for a development consent order (the "Application").</p> <p>The Application seeks authorisation to construct, operate and maintain Hornsea Project Four offshore wind farm, comprising of up to 180 offshore wind turbines together with associated offshore and onshore infrastructure and all associated development (the "Project").</p> <p>This document comprises the MMO's comments submitted in response to Deadline 1.</p> <p>The MMO submits/ comments on the following:</p> <ol style="list-style-type: none"> 1. Written Representation for Deadline 1 2. Notification of wish to speak at any of the Issue Specific Hearings (ISHs) 3. Notification by Statutory Parties of their wish to be considered as an Interested Party (IP) by the ExA 4. Notification of wish to have future correspondence received electronically 5. Comments on Relevant Representations (RRs) 6. Initial Statements of Common Ground (SoCGs) requested by the ExA (see Annex E) 7. Comments on Applicant's revised documents <p>This written representation is submitted without prejudice to any future representation the MMO may make about the Application throughout the examination process. This representation is also submitted without prejudice to any decision the MMO may make on any associated application for consent, permission, approval or any other type of authorisation submitted to the MMO either for the works in the marine area or for any other authorisation relevant to the proposed development.</p>	This is noted by the Applicant.
MMO-REP1-076-1.1	<p><u>1. Written Representation for Deadline 1: Summary of MMO's Relevant representation</u></p> <p>1.1 On 16 December 2021 the MMO submitted the relevant representation response RR-020 to the Planning Inspectorate. The response outlined a number of major comments on the draft development consent order (the "dDCO"), deemed marine licence (the "DML") and Environmental Statement ("ES").</p>	Noted. The Applicant has provided a full response to the points raised by the MMO in their response to Relevant Representations (G1.9 Applicant's comments on Relevant Representations (REP1-038)).
MMO-REP1-076-1.2	<p>1.2 Other than the documents outlined within Section 6 "Comments on Applicant's revised documents" of this submission, the MMO have yet to receive responses from the Applicant regarding the issues raised, and as such our comments within RR-020, and the conclusion that the MMO is not currently satisfied, remains.</p>	

Reference	Stakeholder's Written Representation	Applicant's Response
MMO- REP1-076- 1.3	1.3 Regarding without prejudice compensation measures, such as offshore nesting platforms, the MMO request that these are included as an official schedule into the dDCO. For example, the use of an offshore artificial nesting platform to increase the annual recruitment of black-legged kittiwake and northern gannet (APP-057 Environmental Statement Volume A4 Annex 6.1 Compensation Project Description).	Please see response HRA.1.24 regarding the revised draft DCO.
MMO- REP1-076-2	<p><u>2. Notification of wish to speak at any of the Issue Specific Hearings (ISHs)</u></p> <p>2.1 The MMO may wish to make oral representations at the ISHs that discuss topics within our remit, namely:</p> <ul style="list-style-type: none"> • ISH3 on offshore environmental matters • ISH4 on the marine environment (excluding ornithology) • ISH5 on marine and coastal ornithology • ISH6 on the Habitats Regulations Assessment (should topics fall within our remit) • ISH7 on environmental matters (should topics fall within our remit) • ISH8 on environmental matters (should topics fall within our remit) <p>2.2 We note that the ExA will notify all Interested Parties of the detailed agenda for ISHs closer to the dates, and as such MMO will notify the ExA at this stage whether we wish to make oral representations.</p>	This is noted by the Applicant.
MMO- REP1-076-3	<p><u>3. Notification by Statutory Parties of their wish to be considered as an Interested Party (IP) by the ExA</u></p> <p>The MMO wishes to be considered as an Interested Party by the ExA.</p>	This is noted by the Applicant.
MMO- REP1-076-4	<p><u>4. Notification of wish to have future correspondence received electronically</u></p> <p>The MMO wishes to receive all future correspondence electronically. Please can all correspondence be sent to the following:</p> <ul style="list-style-type: none"> • Paul Stephenson, Marine Licensing Senior Case Manager • Luella Williamson, Marine Licensing Case Manager • Gregg Smith, Marine Licensing Case Officer • MMO Case email address 	This is noted by the Applicant.
MMO- REP1-076-5	<p><u>5. Comments on Relevant Representations (RRs)</u></p> <p>The MMO has reviewed the RRs and notes the comments made. The MMO will continue to maintain a watching brief on future submissions and will provide comment in future where necessary.</p>	This is noted by the Applicant.
MMO- REP1-076-6	<p><u>6. Initial Statements of Common Ground (SoCGs) requested by the ExA (see Annex E)</u></p>	Noted. The Applicant continues to engage with the MMO through the Statement of Common Ground (SoCG) process.

Reference	Stakeholder's Written Representation	Applicant's Response
	<p>The Applicant is currently in the process of organising meetings with ourselves regarding the Statement of Common Ground. The MMO will continue to work with the Applicant on this and would support the deferral of the submission to Deadline 2.</p>	
<p>7. Comments on Applicant's revised documents- G1.10 Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (REP1-039)</p>		
<p>MMO-REP1-076-7.1</p>	<p>7.1 To mitigate impacts from underwater noise (percussive piling) to herring, specifically within the Banks herring spawning ground, the Applicant has made a commitment (Commitment 190 in Volume A4, Annex 5.2: Commitments Register) to avoid percussive piling at the HVAC Booster Station within the export cable corridor route (ECC) during the 'peak' spawning season for herring at the Banks spawning ground, specifically between 1st September and 16th October each year. This commitment is secured by the dDCO Schedule 12, Part 2 - Condition 23.</p>	<p>This is noted by the Applicant.</p>
<p>MMO-REP1-076-7.2</p>	<p>7.2 During the pre-application consultation, the MMO expressed concerns regarding the Applicant's proposal of a seasonal piling restriction based on their estimated 'peak' timing of the herring spawning season. This was due to a lack of supporting data which could be used to determine what the 'peak' weeks/months of herring spawning are for the Hornsea 4 area. On this basis, we recommended piling restrictions for all piling within the ECC, array area and the HVAC booster station for the entire duration of the Banks herring spawning season as well as restrictions on construction activities along the ECC. The seasonal piling restriction for the HVAC booster station takes into account the whole Banks herring spawning season as follows: Piling restriction- DCO Schedule 12, Part 2 - Condition 23. <i>"In the event that driven or part driven pile foundations are to be used to install Work No.3, no impact piling may be undertaken between 1st August and 31st October each year within the area of Work No. 3* as shown on the offshore works plans unless otherwise agreed in writing by the MMO after consultation with the relevant statutory nature conservation body."</i></p>	<p>This is noted by the Applicant.</p>
<p>MMO-REP1-076-7.3</p>	<p>7.3 The Applicant has now provided further evidence to support the appropriateness of a "peak" spawning season as requested by both the MMO (RR-020 Paragraphs 3.7.25- 3.7.36) and Natural England (RR-029 Paragraph 5.65 and appendix G). This is within the document titled "G1.10 Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (REP1-039)" (hereby referred to as "G1.10 Clarification Note").</p>	<p>This is noted by the Applicant.</p>
<p>MMO-REP1-076-7.4</p>	<p>7.4 The MMO have reviewed the information within this document and consulted with our scientific advisors at the Centre for Environment, Fisheries and aquaculture Science (CEFAS). The MMO wish to make the following comments regarding this evidence:</p>	<p>This is noted by the Applicant.</p>

Reference	Stakeholder's Written Representation	Applicant's Response
MMO-REP1-076-7.5	7.5 To determine the commencement of the 'peak' spawning period for herring in the Banks grounds, the Applicant has interrogated International Herring Larval Survey (IHLS) data and performed a back-calculation to identify the most likely date for when herring spawning commenced for the majority of the larvae captured within the IHLS data.	This is noted by the Applicant.
MMO-REP1-076-7.6	7.6 The parameters used in the back-calculation for spawning timings are shown below (ivi) and the MMO have provided comments on the Applicant's use and interpretation of the data under each of these headings: 7.7 IHLS survey timings 7.8 Larval length in survey sample data 7.9 Larval length at hatching 7.10 Egg development duration 7.11 Yolk absorption duration 7.12 Growth rate 7.13 Back Calculation	This is noted by the Applicant.
MMO-REP1-076-7.7.1	7.7 IHLS Survey timings 7.7.1 IHLS data for the Banks stock from 2007-2020 has been interrogated to account for inter-annual variations in larval abundances.	This is noted by the Applicant.
MMO-REP1-076-7.7.2	7.7 IHLS Survey timings 7.7.2 In Table 1, the MMO notes that no start date is provided for the IHLS surveys of 2017, the MMO presumes that this is because there was no IHLS survey conducted in 2017. The MMO requests that the G1.10 Clarification Note should be updated to include a brief explanation of why data from 2017 are not included.	The requested update has been made to the note, with an updated document submitted at Deadline 2 stating that there was no IHLS survey conducted in 2017.
MMO-REP1-076-7.7.3	7.7 IHLS Survey timings 7.7.3 The MMO raises concerns regarding the fact that data from 2018 have also been excluded from use in the back-calculation. We are aware that the 2018 survey was affected by severe technical problems with one of the research vessels, however, abundance data for the Banks component are available for that year (ICES 2020). The G1.10 Clarification Note should therefore be updated to include 2018 data, or alternatively, suitable justification for excluding the 2018 data should be provided.	The Applicant notes there is no publicly available data for 2018 for the Banks stock through the ICES data portal. The only data available through the portal for 2018 is localised to the east coast of the Highlands (Orkneys stock) and is therefore not relevant to G1.10: Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (REP1-039) which focuses on the Banks stock only. If the MMO are able to source and provide the data, the Applicant is willing to update the note accordingly.

Reference	Stakeholder's Written Representation	Applicant's Response
MMO-REP1-076-7.7.4	<p>7.7 IHLS Survey timings</p> <p>7.7.4 The Applicant has considered the start dates of the IHLS surveys as one of their parameters for the back calculation and have determined an average survey start date of 24th September. Taking the survey start dates for the years shown in Table 1, the MMO is content with using the 24th September as an average start date for the back-calculation.</p>	<p>The agreement is welcomed by the Applicant.</p>
MMO-REP1-076-7.8	<p>7.8 Larval Length in Survey Sample Data</p> <p>7.8.1 A larval length of 9mm has been used in the back-calculation. The MMO notes that this length was chosen on the basis that 80% of all larvae recorded within the IHLS surveys from 2007 – 2020 were equal to or less than 9 mm in length; ranging from >56% in the 2007 and 2020 surveys up to 99.9% in the 2013 survey.</p> <p>7.8.2 In principle, the MMO supports the use of a 9mm larval length for the purpose of calculating a conservative estimate of the start of peak spawning, noting that smaller larvae within the survey data will have been spawned later than the calculated start date. However, for the Banks herring stock, ICES classify newly hatched larvae as those <10mm, so taking a precautionary approach, it is also necessary to consider factoring in catches of larvae >9mm as these represent older larvae collected during the sampling period, which would indicate that some eggs are being laid in the first half of August. In order to interrogate the full range and abundance of all larval lengths the MMO requests that all larval data is presented e.g., tabulated or graphic form with standard deviation/error bars. We further recommend that the data is presented in two size ranges: a) 5 - <10mm, and b) 5mm – longest larval length. The data should be presented by individual sampling station so that the average length range by sampling station can be seen.</p>	<p>The note has been updated for Deadline 2 to use a larval length of 10 mm in the back-calculation in line with the ICES classification. However, the Applicant does not consider it appropriate to calculate the spawning period for larvae larger than 10 mm, as the purpose of the clarification note is to identify the peak spawning period for herring, rather than the overall spawning period for the whole Banks stock. Furthermore, 97% of all larvae recorded within the IHLS surveys from 2007 – 2020 were equal to or less than 10 mm in length; ranging from >68% in the 2020 survey to 99.9% in the 2008 and 2013 surveys.</p> <p>A figure has been added to the updated note, presenting the mean larvae lengths for each IHLS sampling station. In addition, the data has also been tabulated to present the means of larvae lengths for each sampling station, for each year.</p>
MMO-REP1-076-7.9	<p>7.9 Larval Length at Hatching</p> <p>7.9.1 Larval lengths at hatching of 6.5 mm (Heath, 1993) and 8 mm (Blaxter and Hempel, 1963) have been used as a back-calculation parameter, to provide a potential range of peak spawning timings based on varying hatch size assumptions. In the MMO's opinion, using these larval lengths does not give a conservative assumption. A conservative approach should factor in values at the extreme ends of the IHLS datasets. Therefore, a more conservative assumption, which better represents larvae that have not yet drifted away from the spawning grounds, would be based on the minimum larval length (5mm) and maximum larval length (10mm).</p> <p>7.9.2 In addition to the required interrogation of the range and abundance of all larval lengths, the MMO suggests that a more comprehensive review of peer-reviewed literature is needed in order to determine and verify an appropriate larval hatch length for the Banks stock. For other projects</p>	<p>The Applicant is confident that the use of larval lengths at hatching as presented by Heath (1993) and Blaxter and Hempel (1963) are appropriate for use as a back-calculation parameter, as these larval lengths are representative of the Banks stock specifically. As noted by the MMO, there are distinct differences between the different stocks and therefore it would not be appropriate to use larval lengths stated in the literature for other stocks. These larval lengths were informed by a comprehensive literature review undertaken by the Applicant, which identified Heath (1993) and Blaxter and Hempel (1963) as the most appropriate larval lengths for the Banks stock. Whilst larvae smaller than the hatch sizes listed in the</p>

Reference	Stakeholder's Written Representation	Applicant's Response
	<p>impacting the Downs component, a hatch length of 7.5mm and 9.5mm was assumed based on appropriate literature (Dickey-Collas, 2005), though it is noted that these sizes are driven by the relatively large egg size compared to the Banks stock and other northern populations. The MMO will utilise time on any follow up consultations on this document, to undertake a more a thorough review of the evidence base provided.</p>	<p>literature were recorded in the IHLS data, these larvae (5mm) were recorded in relatively low numbers and are unlikely to represent a biologically significant proportion of the Banks stock.</p> <p>Notwithstanding the above, the Applicant has updated the note for Deadline 2 to include 5 mm and 10 mm larval lengths as back-calculation parameters to present a range of peak spawning times.</p> <p>The Applicant notes that by including these larval length parameters to the back-calculations, further conservatism will be added to the approach, in addition to those already noted within the note. The Applicant highlights that significant conservatism was already incorporated into the back-calculation, with the yolk absorption period and growth rate running consecutively. Larval growth and yolk absorption would naturally occur simultaneously in larval development, and not consecutively as applied to the calculation.</p>
<p>MMO-REP1-076-7.10.1</p>	<p>7.10 Egg Development Duration 7.10.1 To determine the duration of egg development, a mean seafloor temperature of 12.2°C has been established using temperatures recorded at maximum sampling depth in the IHLS data. The mean seafloor temperature has then been used to determine the durations of temperature dependent egg development based on Russell (1976). The MMO supports the use of the egg development periods described in Russell (1976).</p>	<p>This agreement is welcomed by the Applicant.</p>
<p>MMO-REP1-076-7.10.2</p>	<p>7.10 Egg Development Duration 7.10.2 The MMO, however, does not support the approach taken to establish the mean seafloor temperature. A conservative approach should factor in values at the extreme ends of the IHLS datasets. Accordingly, to establish a mean seafloor temperature, all seafloor temperatures should be taken into account, particularly as it is noted that there has been increased variation in the spread of temperature values (higher and lower values) in more recent years of surveys (2016, 2019 and 2020). Furthermore, when considering piling noise propagation, it is inconsequential that temperatures <12°C in the 2016 – 2020 surveys were found to the north of Hornsea Four and the lowest temperatures (<10°C) were all recorded to the north of the primary larval hotspot within each year's data. Therefore, in order to determine an appropriate seafloor temperature/s, the MMO requests that the Applicant</p>	<p>As stated in paragraph 2.5.1.3 of G1.10: Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (REP1-039), the mean seafloor temperature used to inform the back-calculation was based on all the sample temperatures recorded within the full 14-year dataset. For information purposes, the mean, mode and median temperatures from the dataset are 12.23°C, 12.6°C and 12.6°C respectively. The mean seafloor temperature used in the back-calculation is wherefore the lowest of these values.</p>

Reference	Stakeholder's Written Representation	Applicant's Response
	<p>provides us with the IHLS sea temperature data in tabulated form, so that we may cross reference these values against the larval catch data and against the Applicant's average temperature.</p>	<p>The Applicant has presented the mean temperatures for each sampling station within the updated note, which has been submitted at Deadline 2.</p>
<p>MMO-REP1-076-7.11</p>	<p>7.11 Yolk Absorption Duration For yolk absorption duration, a period of 5 days has been determined partly based on absorption periods described in Russell (1976) and the Applicant's mean seafloor temperature of 12.2°C. Whilst we support the use of the yolk absorption periods as described in Russell (1976), we do not support a mean temperature of 12.2°C (as outlined within 7.10.2 of this submission), therefore the yolk absorption period should be based on the recommended average seafloor temperature determined by interrogation of all IHLS sea temperature data.</p>	<p>The Applicant directs the Examining Authority to the response to comment MMO-REP1-076-7.10.2 above. The Applicant has submitted an updated note at Deadline 2.</p>
<p>MMO-REP1-076-7.12</p>	<p>7.12 Growth Rate Using the equation from Oeberst et al. (2009) and an average seafloor temperature of 12.2°C a growth rate of 0.46 mm d-1 has been calculated. It is the MMO's opinion, that observationally this value is high and not conservative when compared to other values cited. For example, Heath (1993) notes that growth rates estimated from field investigations have been approximately 0.2 to 0.3 mm d-1 and used an assumed larval growth rate of 0.25mm d-1 for the calculation of larval production. Acknowledging that larval growth rates are temperature dependent and noting that we don't support the proposed average seafloor temperature of 12.2°C as a conservative value, we request that the Applicant present the values of larval growth rates cited in the G1.10 Clarification Note in a table, together with any relevant information noted from the literature, e.g. accompanying sea temperatures and stock. The MMO considers that the information will be more digestible for consideration against the requested IHLS sea temperature data.</p>	<p>The Applicant directs the Examining Authority to the response to comment MMO-REP1-076-7.10.2 above.</p> <p>As stated in paragraph 2.7.1.1 of G1.10: Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (REP1-039), the growth rates identified in the literature (e.g. Das, 1972; Fox et al., 2003; Geffen, 2002; Heath, 1993; Hufgnal & Peck, 2011) all used temperatures substantially lower than the average recorded for the Banks stock during the IHLS dataset. Therefore, the Applicant does not think it is appropriate to use these growth rates identified in the literature as they would not be representative of that seen for the Banks stock. The equation from Oberst et al. (2009) was derived from real-world observations of larval growth rates at various temperatures and therefore, enables a realistic, scientifically robust, growth rate to be determined, rather than using an overly conservative value based on a non-representative temperature. The Applicant has presented a table as requested in the updated note, providing the alternative growth rates identified in the literature, for consideration against the IHLS sea temperature data. The Applicant has submitted an updated note at Deadline 2.</p>

Reference	Stakeholder's Written Representation	Applicant's Response
MMO- REP1-076- 7.13	<p>7.13 Back Calculation</p> <p>Whilst the method of back-calculation presented in Section 2.8 (2.8.1.4) of the G1.10 Clarification Note does not seem unreasonable, the values used to support it (i, ii and vi) are not considered precautionary based on the information presented. As outlined above, without sight of the IHLS data for interrogation to support the G1.10 Clarification Note, the MMO are unable to provide any further insight into what the appropriate, conservative values should be. Accordingly, at this stage we do not currently support the Applicant's findings of a start of peak spawning season of 5th September (Scenario A) or 8th September (Scenario B). Nor does the MMO support the Applicant's proposal that the seasonal restriction should run from 1st September – 16th October.</p>	<p>The Applicant directs the Examining Authority to the response to comment MMO-REP1-076-7.10.2 above. The Applicant has submitted an updated note at Deadline 2.</p>
MMO- REP1-076- 7.14	<p>7.14 The MMO thanks the Applicant for the effort that has been made to produce the G1.10 Clarification Note, and we confirm that the data sources used to inform this appear to be appropriate. However, as highlighted above, some of the calculated values used to inform the 'peak' spawning period are not considered sufficiently conservative to be precautionary. A precautionary approach requires allowance for early spawning in some years due to environmental changes (e.g., temperature) and stock size fluctuations which will affect spawning behaviour and timing. On this basis the MMO are currently unable to support a refinement of the seasonal restriction to 1st September – 16th October.</p>	<p>The Applicant directs the Examining Authority to the responses provided above. The Applicant has submitted an updated note at Deadline 2.</p>
MMO- REP1-076- 7.15	<p>7.15 It should also be recognised that IHLS surveys are already intended to sample larvae hatched from eggs that were spawned during the peak of spawning. A lack of resources and participating countries restricts sampling to this limited period when the peak of larval production is most likely.</p>	<p>As stated in paragraph 1.1.1.8 of G1.10: Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (REP1-039), the purpose of the note is to identify the peak spawning period for herring. As acknowledged by the MMO, and the IHLS data surveys are intended to survey the larvae hatched from eggs that were spawned during the peak of spawning. Therefore, the Applicant is confident that the dates calculated and presented within G1.10: Clarification Note on Peak Herring Spawning Period and Seasonal Piling Restriction (REP1-039) represent the peak spawning period for herring. Refinements as suggested by the MMO have been included in the updated note which has been submitted at Deadline 2.</p>
MMO- REP1-076- 7.16	<p>7.16 Taking into account our comments above, whilst a good start has been made and the approach to back-calculation seems reasonable, we are of the opinion that the evidence presented does not</p>	<p>The Applicant directs the Examining Authority to the responses provided above. The Applicant has submitted an updated note at Deadline 2.</p>

Reference	Stakeholder's Written Representation	Applicant's Response
	currently provide adequate justification for a reduced piling restriction and further interrogation of data and scrutiny of cited values are needed before a decision can be made.	
N/A	[7.17 missing from MMO response]	N/A
MMO- REP1-076- 7.18	7.18 The Applicant should also note that in past cases where this method has been applied for the purpose of refining/reducing a piling restriction, additional work was done which looked at noise spread in the context of larval size, using the modelled noise contours and IHLS data. This was done to estimate a migration period for herring to reach the spawning grounds before spawning. For example, at Rampion Offshore Wind Farm this was 8 days ahead of start of estimated earliest hatch date.	<p>The Applicant is confident that the conservatism built into the back-calculation ensures that in reality the migration period for herring would be captured within the defined peak spawning period. The Applicant notes that based on a study by Dickey-Collas (2004), herring migrate from the North to the Banks spawning grounds, therefore migration is unlikely to be affected by the construction of Hornsea Four which lies south of the spawning ground. The Applicant therefore does not consider it necessary to include consideration of the migration period within the piling restriction.</p> <p>Notwithstanding this, as noted within Skaret <i>et al.</i> (2005), herring are considered to have low sensitivity to noise impacts when involved in important life history events such as spawning and migration. Herring are therefore unlikely to be deterred from migrating towards spawning grounds from the construction of Hornsea Four.</p> <p>This reduced sensitivity of herring during spawning (and also migration) is in line with previous requests by the MMO and Cefas to consider herring as static receptors to noise impacts on the basis that they are unlikely to flee from noise when engaged in spawning related activity.</p>
MMO- REP1-076- REF	[References provided]	Noted.

3 References

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