

# Rampion Extension Development Limited

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## Applicant Responses to the Secretary of State's Request for Information – Part 2

**Document Date:** 12 December 2024

**Document Number:** 005576749-01

**Revision:** 01

<b>Company:</b>	RWE Offshore Wind	<b>Asset:</b>	Whole Asset
<b>Project:</b>	Rampion 2	<b>Package:</b>	All
<b>Document Title:</b>	Applicant Responses to the Secretary of State’s Request for Information - Part 2		
<b>Document Number:</b>	005576749-01	<b>Contractor Ref:</b>	N/A

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01	12/12/2024	Responses following a Request for Information	BPJ		
<b>Revision</b>	<b>Date</b>	<b>Status/Reason for Issue</b>	<b>Author</b>	<b>Checker</b>	<b>Approver</b>

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## **1. INTRODUCTION**

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On the 25<sup>th</sup> November 2024, the Secretary of State requested additional information ahead of their final decision on whether or not to grant consent to the Rampion 2 Offshore Wind Farm Extension Project (here after “the Proposed Development”). Rampion Extension Development Limited (hereafter “the Applicant”) has provided responses Part 1 of the requested information in a response dated the 6<sup>th</sup> December 2024, and this report addresses the requests made in Part 2 only.

## **2. APPLICANT’S RESPONSES TO THE SECRETARY OF STATE’S REQUEST FOR INFORMATION**

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The Applicant’s responses to Part 2 of the Secretary of State’s request for information are made below within Table 2.1.

Table 2.1: The Applicant's Responses to the Secretary of State's Requests for Additional Information

Request Number	Topic	Request	Applicant's Response
17	Sensitivity score for cetaceans to PTS	The Secretary of State notes that the Applicant has assessed cetaceans as having a low sensitivity to PTS in Chapter 11 of its ES. Noting the advice of NE and the MMO, the Applicant is requested to provide an amendment to Chapter 11 of its ES to assess cetaceans as having a high sensitivity to PTS.	<p>The Applicant has provided an addition to ES Chapter 11 Marine Mammals (Document Reference 6.2.11, paragraphs 11.9.31 and Table 11-30) which includes an assessment of PTS from pile driving assuming cetaceans using a high sensitivity to PTS (though noting the Applicant still considers this to be unsupported, as presented within <b>[REP3-052]</b>). This additional assessment concludes the following:</p> <ul style="list-style-type: none"> <li>• Sensitivity of all cetaceans = High</li> <li>• Magnitude = Very Low with piling Marine Mammal Mitigation Protocol (MMMP)</li> <li>• Significance = Minor (not significant).</li> </ul> <p>It should be noted that the change in sensitivity to high does not change the overall significance concluded for all cetaceans in relation to PTS (both assessment methodologies concluding a Minor (not significant) effect).</p> <p>This updated document has been provided at the deadline for Part 2 of the Request for Information and also incorporates changes made in relation to the harbour porpoise CEA as a result of request 8 of Part 1 of the Request for Information.</p>
20	Herring and Sandeel Habitat Suitability Assessments ("HSA")	The Secretary of State notes the MMO has not had an opportunity to comment on the Applicant's revised herring and sandeel HSAs submitted at Deadline 6 of the Examination. The MMO is invited to provide comment on the Applicant's revisions.	The Applicant would like to note the continued engagement that has been undertaken with the MMO relating to potential impacts on herring and sandeel. The Applicant has produced two documents following this engagement, which were previously submitted on 13/11/2024, a Statement of Common Ground (SoCG) between the Applicant and the MMO, and a note to provide an update on the discussions held between the Applicant and the MMO regarding potential impacts on herring. Both of these documents have been included as Appendices to this response.

Request Number	Topic	Request	Applicant's Response
21	Monitoring of noise abatement effectiveness on Bottlenose Dolphin	<p>The Secretary of State notes the concerns raised by NE in relation to the proposed noise abatement measures and marine mammals. The Applicant, NE, and the MMO are requested to provide their views on the following possible wording for Condition 11(1)(j) of the DML7:</p> <p><i>"A monitoring plan which accords with the offshore in-principle monitoring plan and is to detail proposals for pre-construction monitoring surveys, construction monitoring, postconstruction monitoring and related reporting;"</i></p>	<p>The Applicant is content with the wording of the condition and notes that it reflects that which has been included in the draft DCO submitted to the Examination [REP6-007]. The Applicant notes that the offshore in-principle monitoring plan, which was updated and submitted as part of the Part 1 response to the Secretary of State, secures the that the final monitoring plan will require monitoring of eight of the first 12 piles in order to validate the assumptions made in the ES for all relevant receptors. The monitoring will also be undertaken in the context of the Applicant's commitment to deployment of a Double Big Bubble Curtain throughout all piling campaigns, as well as the implementation of a piling marine mammal mitigation protocol as secured through condition 11(1)(l).</p>

### **3. APPENDIX 1: STATEMENT OF COMMON GROUND BETWEEN THE APPLICANT AND THE MMO**

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# Rampion 2 Wind Farm

## Statement of Common Ground – Post Examination Herring Issues Marine Management Organisation

**November 2024**

Document Reference: 005458219-01







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For	Marine Management Organisation

Signed	
Date	
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For	Rampion Extension Development Ltd (RED) (the Applicant)

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# 1. Introduction

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## 1.1 Background

- 1.1.1 This Statement of Common Ground (SoCG) has been prepared between Rampion Extension Development Limited (RED) (hereafter referred to as ‘the Applicant’) and the Marine Management Organisation (MMO) to set out the areas of agreement and disagreement between the two parties in relation to the Proposed Development Consent Order (DCO) Application for the Rampion 2 Offshore Wind Farm (hereafter referred to as “Rampion 2” or “the Proposed Development”).
- 1.1.2 This SoCG covers issues related to impacts on spawning herring, where progress has been made post-examination, to address the two main remaining concerns raised by the MMO in their Deadline 6 submission **[REP6-302]**:
- The MMO raised a concern that the herring potential spawning habitat heatmaps submitted at Deadline 1 **[REP1-020]**, and updated by the Applicant at Deadline 4 **[REP4-061]** were not completely aligned with the heatmap methodologies preferred by the MMO, namely Reach et al., (2013) and MarineSpace (2013). The Applicant updated the heatmaps at Deadline 6 **[REP6-250]** following the MMO’s preferred methodology, but the MMO had not had the opportunity to review this update in time for their Deadline 6 submission **[REP6-302]**. During a meeting with the MMO on the 16 October 2024, the MMO confirmed that the heatmaps are now in accordance with the suggested methodology. As such, this concern has now been resolved.
  - The MMO also had concerns regarding the level of noise abatement that could be achieved by the commitment to using double big bubble curtains (DBBC) throughout the piling campaign in the deeper areas of the Rampion 2 array area. This concern was raised following the Deadline 4 submission by the Applicant of **Information to support efficacy of noise mitigation / abatement techniques with respect to site conditions at Rampion 2 Offshore Windfarm [REP4-067]** which detailed that the efficacy of DBBC may be reduced by 1 to 2 decibels (dB) in waters deeper than 40m, reducing the overall predicted dB reduction from -15dB to -13dB. The Applicant has since shared with the MMO noise modelling for herring, showing the underwater noise impact ranges, relative to herring larval densities (displayed as a heatmap) with a predicted -13dB reduction as the worst-case mitigated piling scenario. The updated heatmaps are provided in this document in **Appendix 1**.

## 1.2 The Proposed Development

- 1.2.1 The Applicant is developing the Rampion 2 Offshore Wind Farm Project (Rampion 2) located adjacent to the existing Rampion Offshore Wind Farm Project (‘Rampion 1’) in the English Channel.
- 1.2.2 Rampion 2 will be located between 13km and 26km from the Sussex Coast in the English Channel and the offshore array area will occupy an area of approximately 160km<sup>2</sup>.

- 1.2.3 The key offshore elements of the Proposed Development will be as follows:
- up to 90 offshore wind turbine generators (WTGs) and associated foundations;
  - blade tip of the WTGs will be up to 325m above Lowest Astronomical Tide (LAT) and will have a 22m minimum air gap above Mean High Water Springs (MHWS);
  - inter-array cables connecting the WTGs to up to three offshore substations;
  - up to two offshore interconnector export cables between the offshore substations;
  - up to four offshore export cables each in its own trench, will be buried under the seabed within the final cable corridor; and
  - the export cable circuits will be High Voltage Alternating Current (HVAC), with a voltage of up to 275kV.
- 1.2.4 The key onshore elements of the Proposed Development will be as follows:
- a single landfall site near Climping, Arun District, connecting offshore and onshore cables using Horizontal Directional Drilling (HDD) installation techniques;
  - buried onshore cables in a single corridor for the maximum route length of up to 38.8km using:
    - ▶ trenching and backfilling installation techniques; and
    - ▶ trenchless and open cut crossings.
  - a new onshore substation, proposed near Cowfold, Horsham District, which will connect to an extension to the existing National Grid Bolney substation, Mid Sussex, via buried onshore cables; and
  - extension to and additional infrastructure at the existing National Grid Bolney substation, Mid Sussex District to connect Rampion 2 to the national grid electrical network.

A full description of the Proposed Development is provided in **Chapter 4: The Proposed Development, Volume 2** of the ES **[REP6-172]**.

## 2. Marine Management Organisation's Remit

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### 2.1 Introduction

2.1.1 The MMO is an executive non-departmental public body whose purpose is to protect and enhance the marine environment in English waters and support economic growth by enabling sustainable marine development.

2.1.2 The MMO's role in relation to the Planning Act 2008 are as follows:

- as a statutory consultee at the pre-application stage under s.42(1)(aa) of the 2008 Act and as an interested party during the examination stage; and
- as a licensing and consenting body.

2.1.3 The SoCG covers topics of the DCO application of relevance to the MMO, comprising:

- DCO and Securing Mechanisms;
  - ▶ Fish & Shellfish Ecology;

## 2.2 Consultation Summary

2.2.1 This section briefly summarises the consultation, specific to underwater noise and spawning herring, that the Applicant has undertaken with the MMO including both statutory and non-statutory engagement during the pre-application, post-application, and post-examination phases (See **Table 2-1**).

**Table 2-1 Consultation and Correspondence undertaken with MMO pre-application**

Date and type	Description of consultation
24 February 2022 Targeted Meeting	Additional targeted Underwater Noise (UWN) mitigation meeting.
12 September 2022 Targeted Meeting	Underwater noise Black Bream.
30 March 2023 Targeted meeting	Underwater noise in Black Bream
19 April 2024 Expert to Expert Meeting	Expert to Expert Underwater Noise Meeting
24 June 2024 Expert to Expert Meeting	Expert to Expert Underwater Noise Meeting
16 October 2024 Expert to Expert Meeting	Expert to Expert Meeting: Underwater Noise and Herring

### 3. Agreement/Disagreement Log

- 3.1.1 The following sections of this SoCG set out the level of agreement between the Applicant and the MMO for each relevant component of the Application identified in **paragraph 2.1.3**. The tables below detail the positions of the Applicant alongside those of the MMO and whether the matter is agreed or not agreed.
- 3.1.2 In order to easily identify whether a matter is ‘agreed’, ‘not agreed’ or an ‘ongoing point of discussion’, the agreements log in the tables below are colour coded to represent the status of the position according to the criteria in **Table 3-1** below.

**Table 3-1 Position status key**

Position Status	Colour Code
The matter is considered to be agreed between the parties	Agreed
The matter is not agreed between the parties, however the outcome of the approach taken by either the Applicant or the MMO is not considered to result in a material outcome on the assessment conclusions.	Not agreed- No material impact
The matter is not agreed between the parties and the outcome of the approach taken by either the Applicant or the MMO is considered to result in a materially different outcome on the assessment conclusions.	Not agreed- material impact



Table 3-2 Status of discussions with the MMO

Reference number	Matter of contention	MMO'S position	Applicant's position	Current Status	Date of agreement
MMO1	DCO condition wording amendment -piling ban eastern array area	The MMO is content with the inclusion of the condition, but it may be subject to minor alterations.	<p>Following the presentation of Figure 4 (see Appendix 1) to the MMO, the Applicant has provided the Herring Spawning Restriction Plan (Appendix 2, Figure 5), which is a simplified version of Figure 4 and will be provided with the DML, with the following suggested wording for the condition. This has been provided on a without prejudice basis, depending on if the Secretary of State agrees a piling ban for spawning herring is necessary.</p> <ol style="list-style-type: none"> <li>1) No piling activity can commence within the eastern array area during the herring spawning season until a spawning herring piling restriction plan (in accordance with the outline spawning herring piling restriction plan) containing updated underwater noise modelling has been submitted to and approved by the MMO. The updated underwater noise model shall be based on final project parameters to be used to install piles in the eastern array area and shall include details of any verified mitigation measures to be employed.</li> <li>2) If the herring spawning plan demonstrates that noise levels associated with piling activity in the eastern array area during the herring spawning season will exceed the levels shown on the spawning herring piling restriction plan then no piling activity may be undertaken within the eastern array area during the herring spawning season without the approval of the MMO</li> <li>3) All piling activity within the eastern array area during the herring spawning season must be undertaken in accordance with the details approved under sub-paragraph (1) or as required as a condition of approval under sub-paragraph (2)</li> <li>4) In this condition:               <ol style="list-style-type: none"> <li>a) "eastern array area" means the area identified as the eastern array area within the spawning herring piling restriction plan;</li> <li>b) "outline spawning herring piling restriction plan" means the plan certified as the outline spawning herring piling restriction plan by the Secretary of State for the purposes of the Order under article 51; and</li> <li>c) "herring spawning season" means 1 November to 31 January inclusive.</li> </ol> </li> </ol>	Agreed	11/11/2024
MMO2	Piling ban - western array area	The MMO is content that with the inclusion of year-round double-big bubble-curtains no ban is required in the western area.	As demonstrated by the modelling shared with the MMO in the meeting on 16 October 2024, with the implementation of year-round double big bubble curtains (C-265, as secured by 11(1)(k) of the dMLS, Schedule 11 and 12 of the DCO) <b>[REP6-007]</b> there will be a very small impact on areas of potential high herring larval abundance and subsequently a	Agreed	16/10/2024

Reference number	Matter of contention	MMO'S position	Applicant's position	Current Status	Date of agreement
MMO3	Herring potential spawning heatmaps	<p>The MMO raised a concern that the herring potential spawning habitat heatmaps submitted at Deadline 1 <b>[REP1-020]</b>, and updated by the Applicant at Deadline 4 <b>[REP4-061]</b> were not completely aligned with the heatmap methodologies preferred by the MMO, namely Reach et al., (2013) and MarineSpace (2013). The Applicant updated the heatmaps at Deadline 6 <b>[REP6-250]</b> following the MMO's preferred methodology, but the MMO had not had the opportunity to review this update in time for their Deadline 6 submission. The MMO is content this has been resolved.</p>	<p>herring piling ban is not required in the western array area during the herring spawning period.</p> <p>During the meeting with the MMO on 16 October 2024, the MMO confirmed that the heatmaps are now in accordance with the suggested methodology. As such, this concern has now been resolved.</p>	Agreed	16/10/2024

Appendix 1 – Images shared in meeting with the MMO 16 October 2024

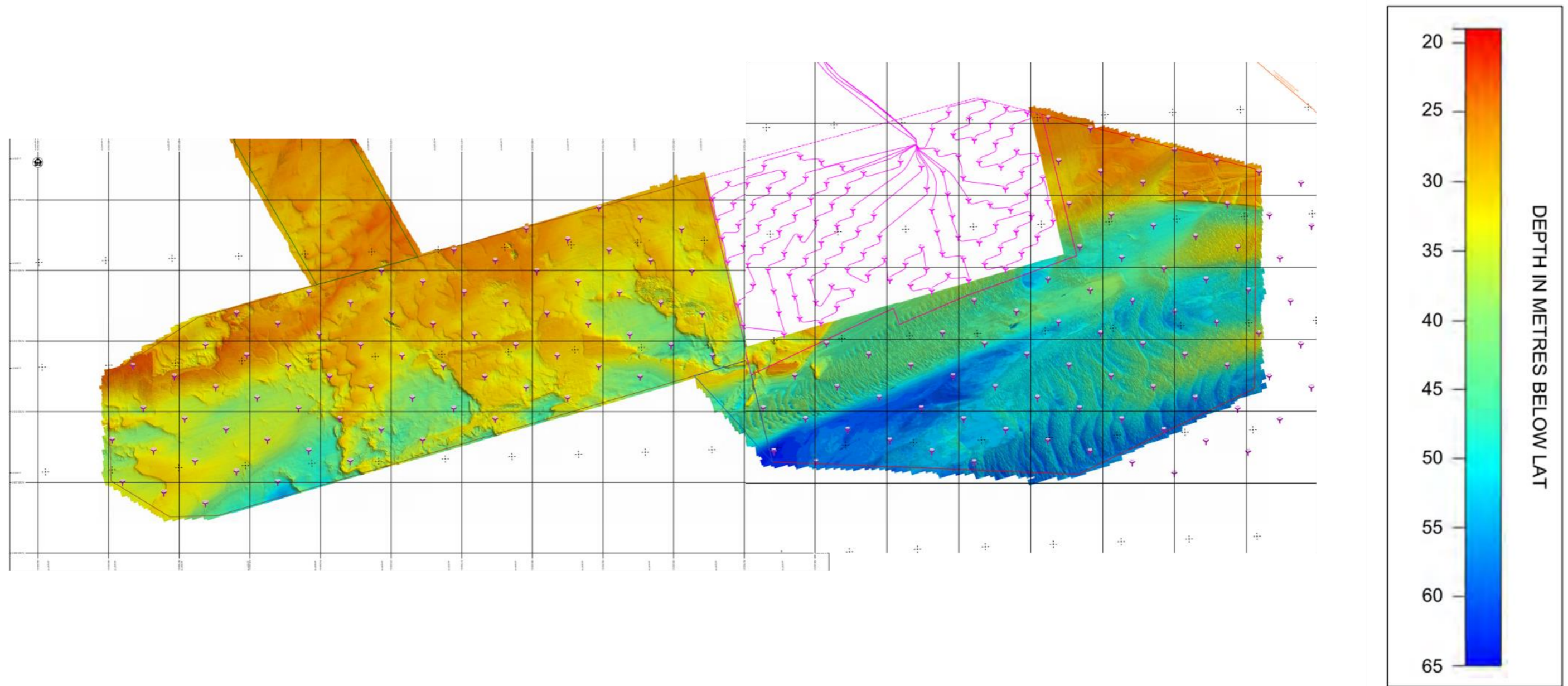


Figure 1 Bathymetry of Rampion 2 Array Area

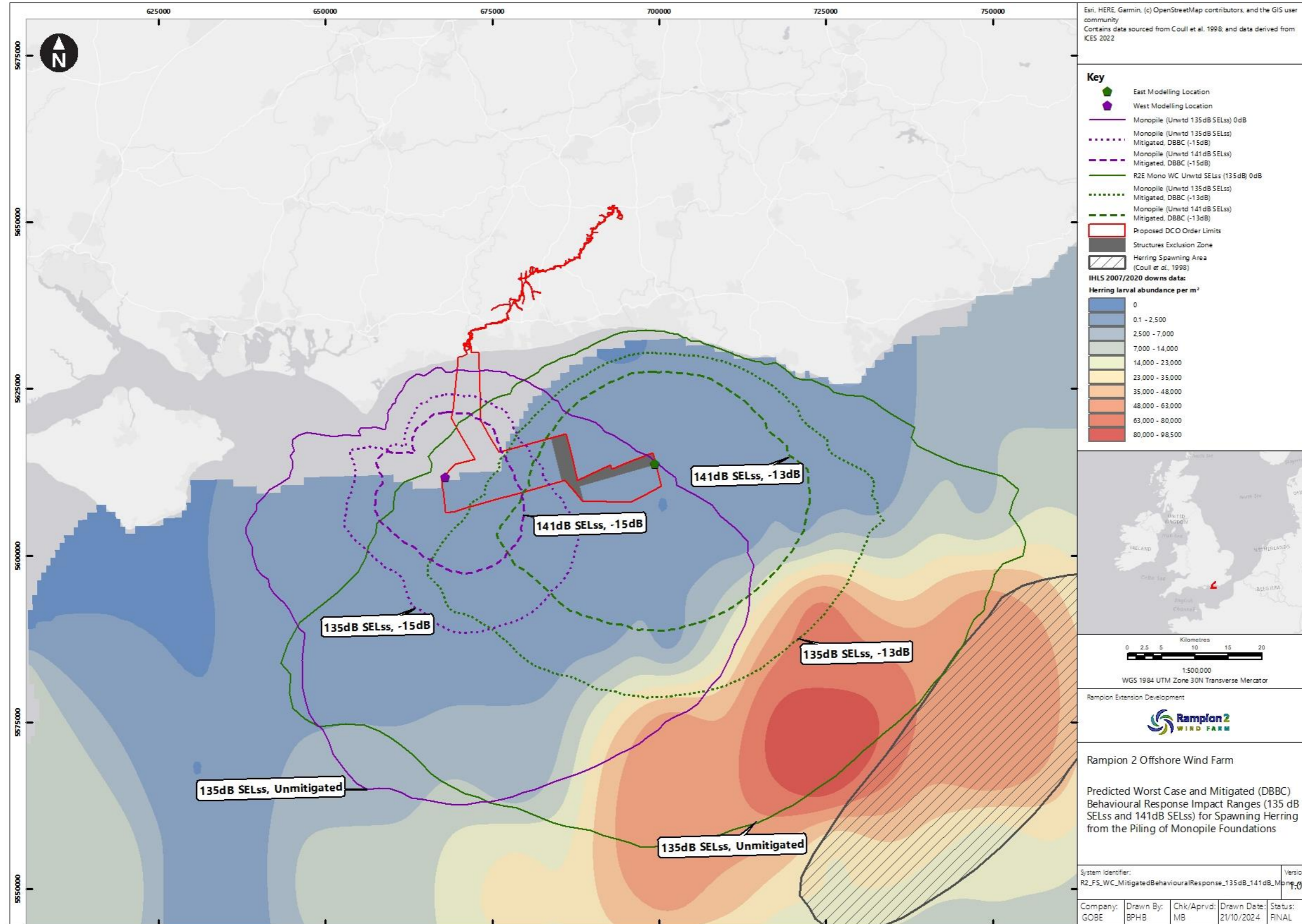


Figure 2 Predicted Worst Case and Mitigated (DBBC) Behavioural Response Impact Ranges (135dB SELss and 141dB SELss) for Spawning Herring from the Piling of Monopile Foundations

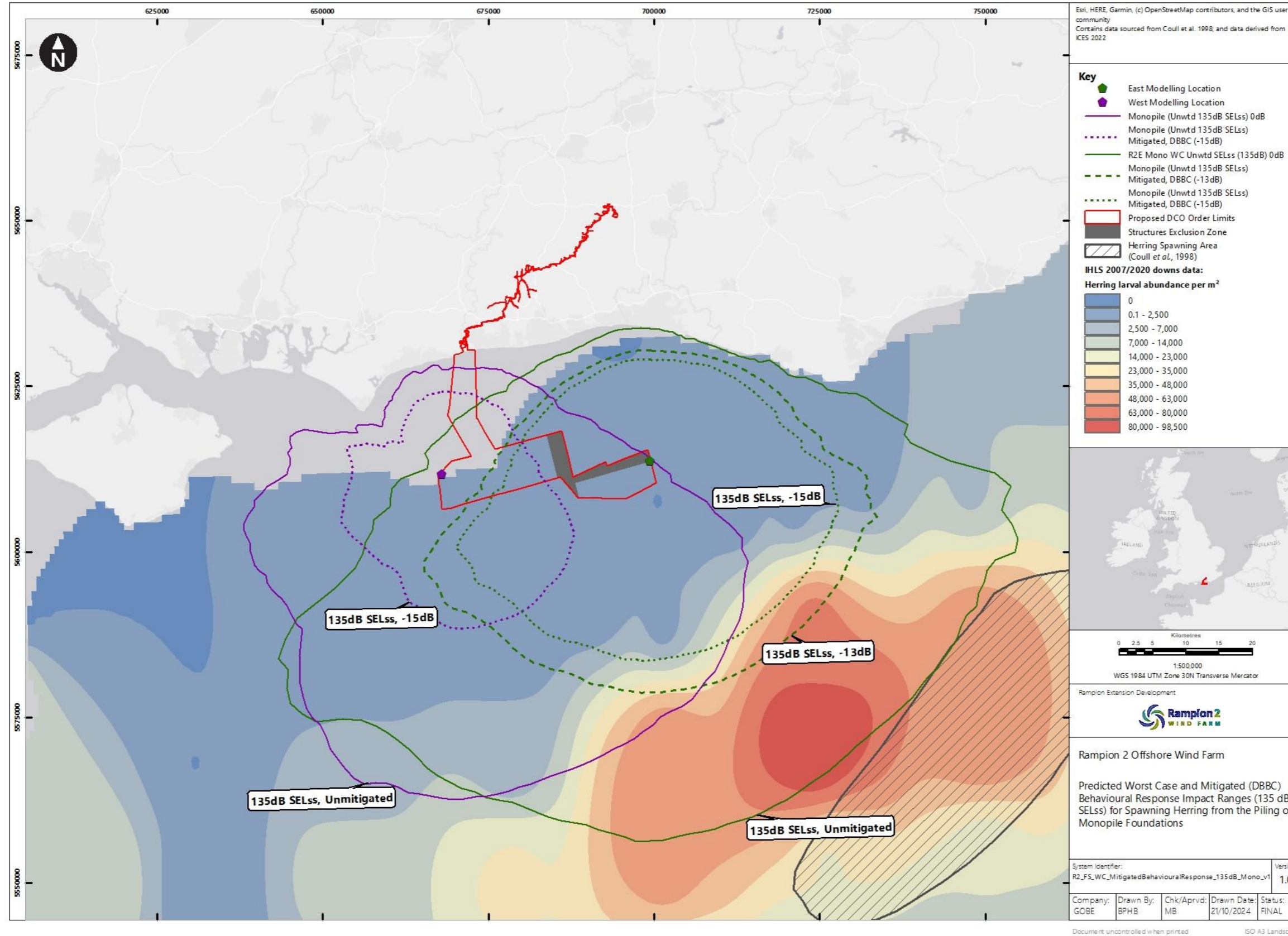


Figure 3 Predicted Worst Case and Mitigated (DBBC) Behavioural Response Impact Ranges (135dB SELs) for Spawning Herring from the Piling of Monopile Foundations

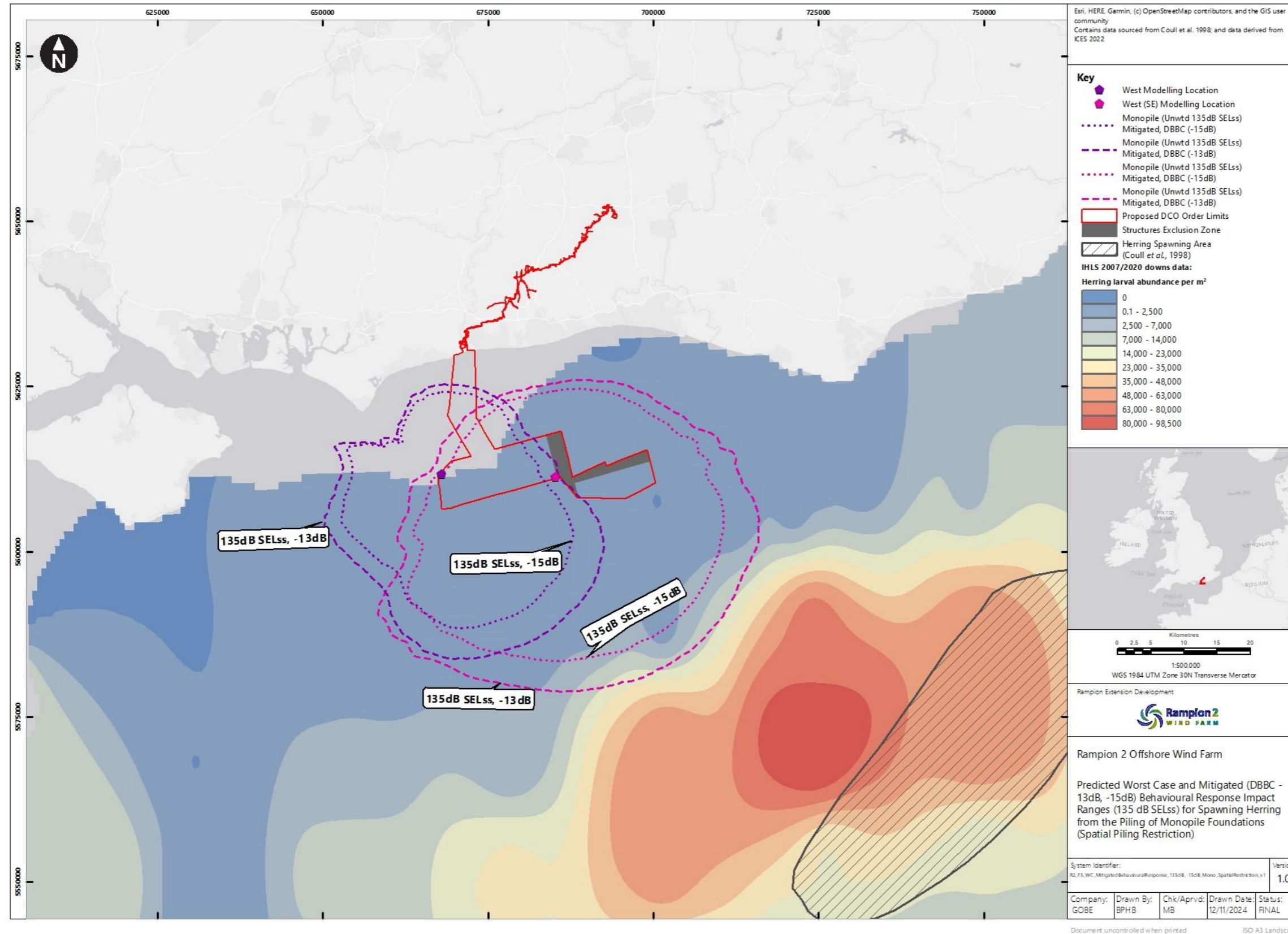


Figure 4 Predicted Worst Case and Mitigated (DBBC, -13dB, -15dB) Behavioural Response Impact Ranges (135dB SELs) for Spawning Herring from the Piling of Monopile Foundations (Spatial Piling Restriction)

Outline Spawning Herring Piling Restriction Plan showing agreement with the MMO, as referred to in the DML condition.

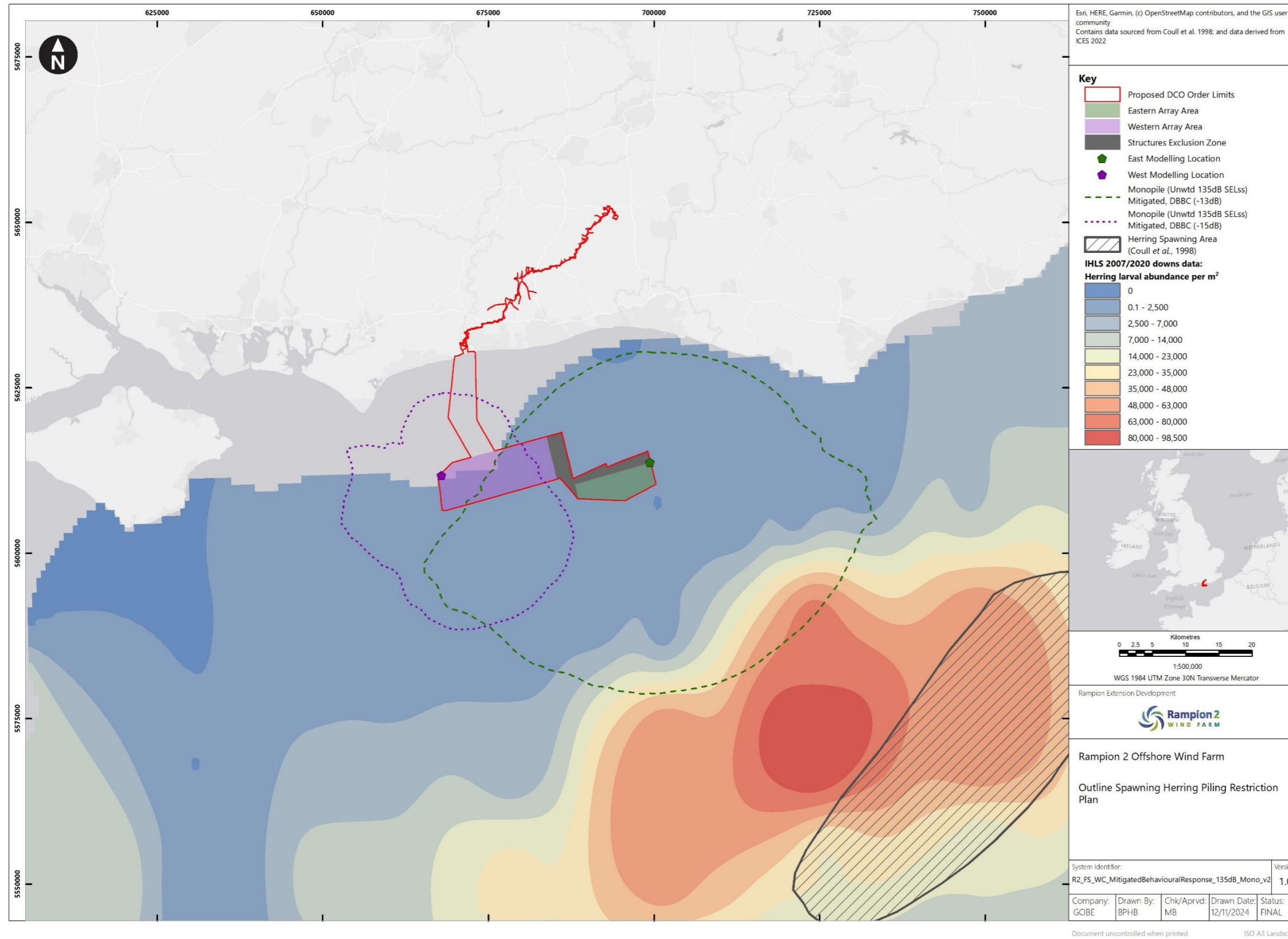


Figure 5 Outline Spawning Herring Piling Restriction Plan

## 4. References

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Rampion 2 DCO Project Glossary:

[1.7 Rampion 2 Application Document Tracker \(planninginspectorate.gov.uk\)](#)

Examination Library - [EN010117-000419-Rampion 2 Exam Library.pdf \(planninginspectorate.gov.uk\)](#)

Planning Inspectorate Application Area- [Rampion 2 Offshore Wind Farm - Project Information \(planninginspectorate.gov.uk\)](#)





## **4. APPENDIX 2: POST-EXAMINATION HERRING NOTE**

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# Rampion Extension Development Limited



## Post Examination Herring Issues

**Document Date:** 11 November 2024

**Document Number:** 005458212-01

**Revision:** 01

<b>Company:</b>	RWE Offshore Wind	<b>Asset:</b>	Whole Asset
<b>Project:</b>	Rampion 2	<b>Package:</b>	All
<b>Document Title:</b>	Post Examination Herring Issues		
<b>Document Number:</b>	005458212-01	<b>Contractor Ref:</b>	N/A

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Revision	Date	Status/Reason for Issue	Author	Checker	Approver
01	12/11/2024	Post Examination Herring Issues	GoBe	RED	RED

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# 1. INTRODUCTION

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At the close of the Rampion 2 Offshore Windfarm (Rampion 2) Examination, the Applicant and the MMO were in advanced discussions to agree suitable underwater noise mitigation for spawning Downs stock herring. As detailed in the Applicant's Closing Statement, submitted at Deadline 6 [REP6-233, paragraph 5], the Applicant has continued to seek agreement with the MMO, and update the SoS on any progress prior to determination of the application. As set out in the MMO's Deadline 6 Submission [REP6-302, paragraph 5.7.15], the MMO had two outstanding concerns that affected their confidence in the underwater noise modelling for herring:

- The MMO raised a concern that the herring potential spawning habitat heatmaps submitted at Deadline 1 [REP1-020], and updated by the Applicant at Deadline 4 [REP4-061] were not completely aligned with the heatmap methodologies preferred by the MMO, namely Reach *et al.*, (2013) and MarineSpace (2013). The Applicant updated the heatmaps at Deadline 6 [REP6-250] following the MMO's preferred methodology, but the MMO had not had the opportunity to review this update in time for their Deadline 6 submission [REP6-302]. During a meeting with the MMO on the 16 October 2024, the MMO confirmed that the heatmaps submitted at Deadline 6 are now in accordance with the suggested methodology. Consequently, this concern has now been resolved.
- The MMO also had concerns regarding the level of noise abatement that could be achieved by commitment C-265 (as secured by 11 (1) (k) of the deemed Marine Licence, Schedules 11 and 12 of the **draft Development Consent Order [REP6-007]**) to using double big bubble curtains (DBBC) throughout the piling campaign in the deeper areas of the Rampion 2 Array Area. This concern was raised following the Deadline 4 submission by the Applicant of **Information to support efficacy of noise mitigation / abatement techniques with respect to site conditions at Rampion 2 Offshore Windfarm [REP4-067]** which detailed that the efficacy of DBBC may (depending on how quickly technology advances) be reduced by 1 to 2 decibels (dB) in waters deeper than 40m, reducing the overall predicted dB reduction from -15dB to -13dB. The Applicant has since shared with the MMO noise modelling for herring, showing the underwater noise impact ranges, relative to herring larval densities (displayed as a heatmap) with a predicted -13dB reduction as the worst-case mitigated piling scenario. The updated heatmaps are provided in this document in **Appendix A**.

As a result of the concerns regarding the level of noise abatement that could be achieved, the MMO recommended in its Deadline 6 submission that the following condition be included in the Development Consent Order (DCO):

*"(XX) — (1) The undertaker must not undertake pile driving during the herring spawning period.*

*(2) The "herring spawning period" means a period within 1 November and 31 January, inclusive."*

Following the presentation of **Figure 3 (Appendix A)** to the MMO, which clearly shows that with a -13db noise mitigation, impacts on areas of moderate herring larvae density would be avoided if piling was only undertaken in the western portion of the array area during the herring spawning period. Subsequently, the MMO agreed that a piling ban during the herring spawning period (November to January) across the Array Area would not be required.

The Applicant has agreed the following condition wording with the MMO and provided it in the Statement of Common Ground – Post Examination Herring Issues Marine Management Organisation on a without prejudice basis, should the Secretary of State disagree with the Applicant's position at the close of the Examination (**Applicant's Closing Statement [REP6-233]** paragraph 5.8.19 *et seq.*)—that no significant effects on the Downs herring stock would occur and, as such, a piling ban for spawning herring is not required.

1. No piling activity can commence within the eastern array area during the herring spawning season until a spawning herring piling restriction plan (in accordance with the outline spawning herring piling restriction plan) containing updated underwater noise modelling has been submitted to and approved by the MMO. The updated underwater noise model shall be based on final project parameters to be used to install piles in the eastern array area and shall include details of any verified mitigation measures to be employed.
2. If the herring spawning plan demonstrates that noise levels associated with piling activity in the eastern array area during the herring spawning season will exceed the levels shown on the spawning herring piling restriction plan then no piling activity may be undertaken within the eastern array area during the herring spawning season without the approval of the MMO
3. All piling activity within the eastern array area during the herring spawning season must be undertaken in accordance with the details approved under sub-paragraph (1) or as required as a condition of approval under sub-paragraph (2)
4. In this condition:
  - a) "eastern array area" means the area identified as the eastern array area within the spawning herring piling restriction plan;
  - b) "outline spawning herring piling restriction plan" means the plan certified as the outline spawning herring piling restriction plan by the Secretary of State for the purposes of the Order under article 51; and
  - c) "herring spawning season" means 1 November to 31 January inclusive.

**Figure 1, Figure 2 and Figure 3 (Appendix A** of this document), display the -13dB noise mitigation, as defined using the MMO's suggested behavioural threshold for herring of 135dB SEL<sub>ss</sub> (single strike sound exposure level) (as derived from Hawkins *et al.* (2014)).

However, as set out in detail in **Chapter 8: Fish and Shellfish Ecology [REP6-179]** the Applicant considers that 135dB SEL<sub>ss</sub> suggested by the MMO, is an overly precautionary threshold which is not backed by robust scientific evidence for the following reasons:

- The use of the 135dB SEL<sub>ss</sub> threshold is not supported in the literature (Hawkins *et al.*, 2014) for use in impact assessments;
- The 135dB SEL<sub>ss</sub> behavioural threshold is based on a study undertaken within a quiet loch on fish not involved in any particular activity (i.e. not spawning), and it is therefore not considered appropriate to use this threshold within a much noisier area such as the English Channel (which is subject to high levels of anthropogenic activity and noise) as the fish within this area would reasonably be expected to be accustomed to higher levels of noise and would thus have a correspondingly lower sensitivity to disturbance by noise; and
- The 135 dB SEL<sub>ss</sub> threshold represents only a brief startle response (sudden short-lived changes in swimming speed) in a species known to be particularly sensitive, sprat, and should not be considered suitable to represent the major behavioural changes that would constitute a population level effect on Downs stock herring.

As set out in paragraph 5.8.19 *et seq.* of the **Applicant's Closing Statement [REP6-233]**, the Applicant has maintained the position set out in the Environmental Statement, and through Examination, that there will be no population level effect on spawning herring at the Downs stock spawning ground, as there is no overlap of the recognised spawning ground (as defined by Coull *et al.*, 1998) at a noise level that will disturb spawning adult herring (186dB SEL<sub>cum</sub> (cumulative sound exposure level)), and no interaction of noise at injurious levels for eggs and larvae (210dB SEL<sub>cum</sub>) with areas of high larval abundances. The Applicant remains confident, that on the basis of the mitigated underwater noise contours (-15dB mitigation from the use of DBBC (Commitment C-265) (**Commitments Register [REP6-226]**)) presented in **Figure 2** below,

which do not interact with the herring spawning ground (as defined by Coull *et al.*, 1998) or areas of the highest densities of herring larvae, even when adopting the 135 dB SEL<sub>ss</sub> threshold suggested by the MMO, there is no requirement for a seasonal piling restriction for herring.

**Programme Implications**

As detailed in paragraph 9.4 the **Applicant’s Closing Statement [REP6-233]** piling bans for both black seabream and spawning herring would elongate the development programme. Preliminary construction modelling has strongly indicated that multiple piling bans would be extremely challenging, leading to an additional year or more of offshore installation activity being required. It would likely result in a reduction of the total capacity of generation that could be installed or could make the project unviable by considerably limiting the project’s prospects of securing funding and getting built. This would be in conflict with the urgent need for renewable energy set out in NPS EN-1 (2011), the Critical National Priority status for offshore wind set out in NPS EN-3 (2023), and the 50 GW by 2030 target for offshore wind set out in the British Energy Security Strategy (2022).

**Concluding Remarks**

The Applicant maintains that a piling ban during the herring spawning period of November – January is not required and introducing one would place a significant burden on the construction schedule of Rampion 2 (as shown on **Table 1**), particularly when considering the existing commitments of the Applicant regarding the black seabream spawning period of March – July (C-265, C-274, C-280 and C-281), as set out in the **In Principle Sensitive Features Mitigation Plan [REP5-082]** which provides full details of the suite of mitigation measures proposed to reduce underwater noise impacts on spawning black seabream.

**Table 1: Piling bans proposed by statutory bodies**

Blue indicates the MMOs’ suggested piling ban for herring, grey indicates Natural England’s and the MMO’s suggested piling ban for black seabream

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec



## 2. REFERENCES

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### 3. APPENDIX A

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To address the potential uncertainties of the efficacy of the proposed NAS (DBBC) in water depths of >40m, the Applicant has undertaken modelling of -13dB mitigation for piling operations in the eastern portion of the array area (where water depths mostly exceed 40m). The -13dB mitigated impact contours are presented alongside the -15dB contours in the western array area (where waters are predominantly  $\leq 40\text{m}$  in depth) in **Figure 1**, **Figure 2** and **Figure 3**. The unmitigated impact ranges are also provided for context. The impact ranges are presented relative to the Downs stock herring spawning ground, as defined by Coull et al. (1998), and densities of herring larvae (shown as a heatmap), as informed by 10 years of International Herring Larvae Surveys (IHLS) data (2007-2020).

**Figure 1** shows the predicted worst case and mitigated (DBBC, -13dB) behavioural response impact ranges for spawning herring, from the piling of monopile foundations, as defined using the 135dB SEL<sub>ss</sub> threshold (as supported by the MMO) and the 141dB SEL<sub>ss</sub> impact threshold<sup>1</sup>. As evident in **Figure 1**, the -13dB mitigated contour, as defined using the 141dB SEL<sub>ss</sub> threshold shows a clear reduction in the underwater noise impact ranges. In contrast, the mitigated contour defined using the 135dB SEL<sub>ss</sub> threshold (the use of which the MMO support), has a slight interaction with moderate densities of herring larvae.

**Figure 2** shows the reduced impact ranges afforded by -13dB mitigation in the eastern portion of the array area, where deeper waters are apparent ( $\geq 40\text{m}$ ), relative to the -15dB mitigated impact contours (which were initially provided to the Planning Inspectorate at Deadline 4 [REP4-061]). As evident in **Figure 2**, the mitigated (-13dB) contour from piling in the eastern portion of the array area has a slight interaction with moderate densities of herring larvae. In comparison, the mitigated (-15dB) impact contour, overlaps a much smaller portion of moderate densities of herring larvae.

**Figure 3** shows the reduced impact ranges afforded by -13dB mitigation relative to -15dB mitigation contours, from piling operations in the western portion of the array area only, to reflect a commitment for a piling restriction across the eastern portion of the array during the herring spawning season. As evident in **Figure 3**, with piling operations in the western and southeastern extents of the west portion of the array area only, there is no interaction of the impact contours with any areas of moderate densities of herring larvae. It should be acknowledged that water depths in the western portion of the array are predominantly under 40m, and therefore the use of DBBC in this area will achieve -15dB noise abatement (as detailed in **Information to support efficacy of noise mitigation / abatement techniques with respect to site conditions at Rampion 2 Offshore Windfarm [REP4-067]**).

**Figure 4** shows the Outline Spawning Herring Piling Restriction Plan, as relative to the condition defined above. The eastern and western array areas as referred to in the condition are clearly defined. The Plan shows the reduced impact ranges afforded by -13dB mitigation in the eastern array area, where deeper waters are apparent ( $\geq 40\text{m}$ ). Reduced impact ranges afforded by -15dB mitigation are also presented, from piling operations in the western portion of the array area only where water depths are predominantly under 40m, and therefore the use of DBBC in this area will achieve -15dB noise abatement (as detailed in **Information to support efficacy of noise mitigation / abatement techniques with respect to site conditions at Rampion 2 Offshore Windfarm [REP4-067]**).

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<sup>1</sup> The 141dB SEL<sub>ss</sub> threshold has been presented for context purposes only; the 141dB SEL<sub>ss</sub> threshold has been presented by the Applicant as an alternative behavioural impact threshold to the 135dB SEL<sub>ss</sub> threshold, for sensitive fish species in the Environmental Statement [REP6-179] and throughout Examination [REP1-012, REP3-045, REP4-053, REP5-082].

Figure 1: Predicted worst case and mitigated (DBBC) behavioural response impact ranges (135dB SEL<sub>SS</sub> and 141dB SEL<sub>SS</sub>) for spawning herring from the piling of monopile foundations

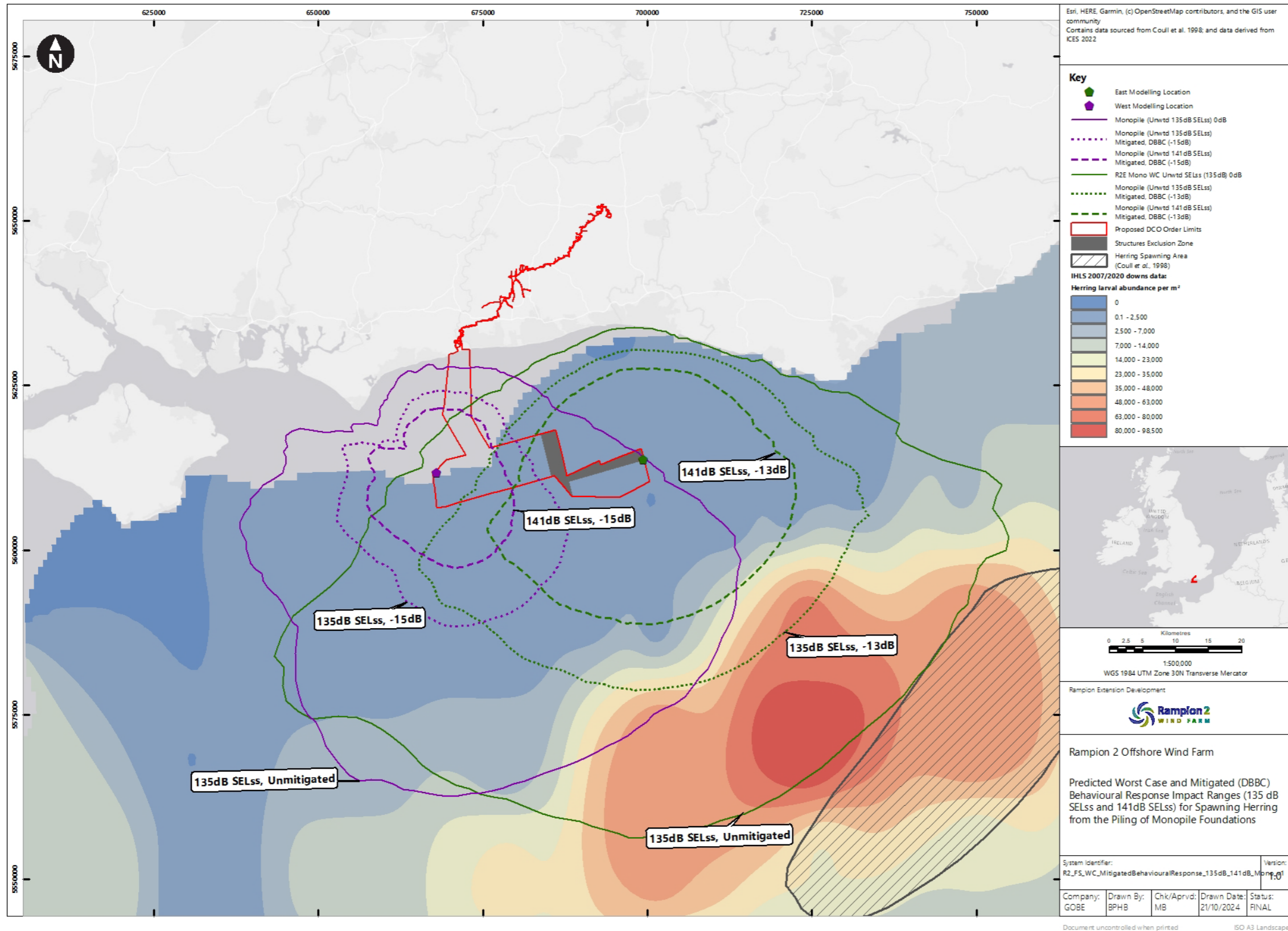


Figure 2: Predicted worst case and mitigated (DBBC) behavioural response impact ranges (135dB SEL<sub>ss</sub>) for spawning herring from the piling of monopile foundations

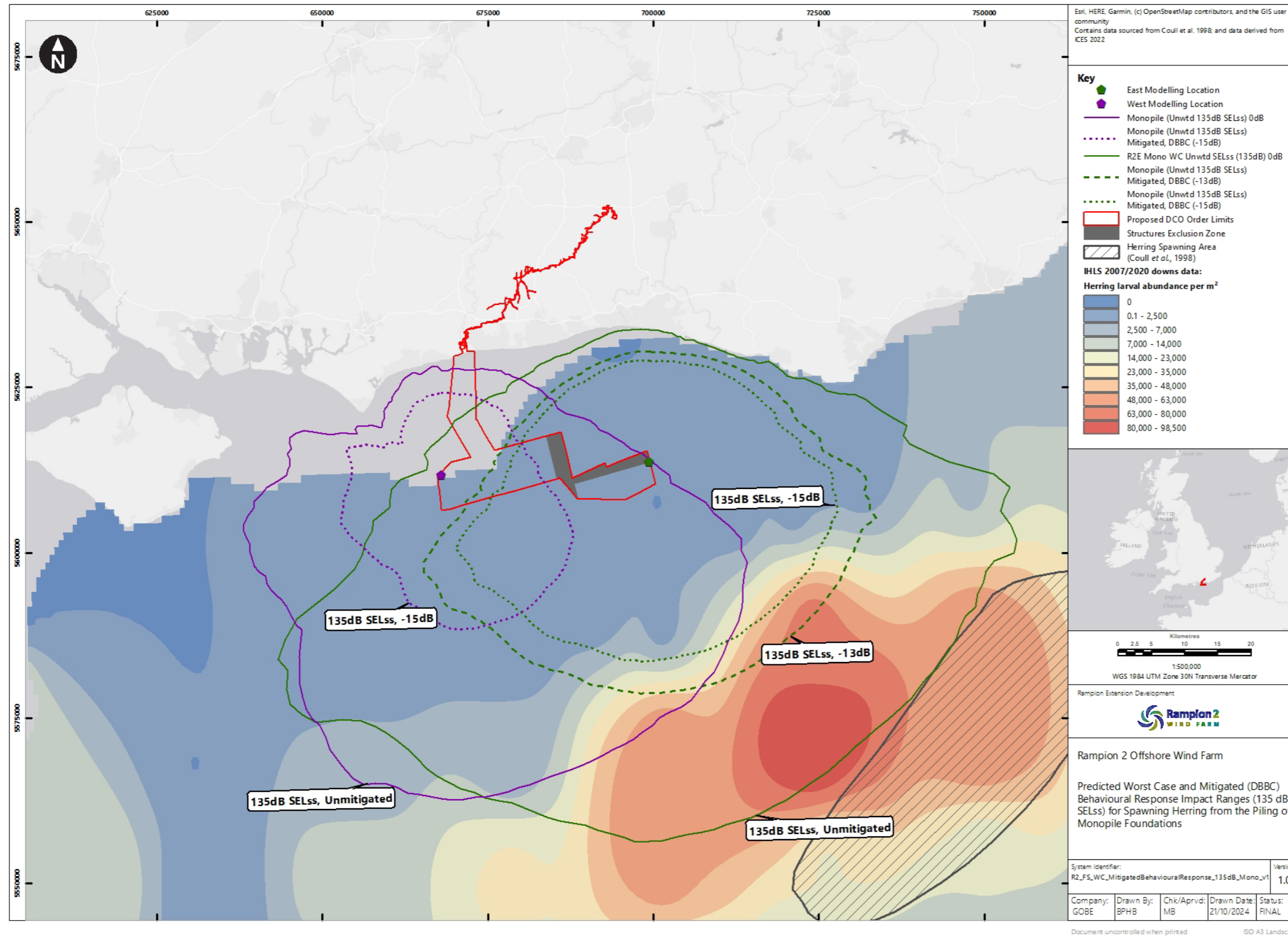


Figure 3: Predicted worst case and mitigated (DBBC, -13dB, -15dB) behavioural response impact ranges (135dB SEL<sub>ss</sub>) for spawning herring from the piling of monopile foundations (spatial piling restriction)

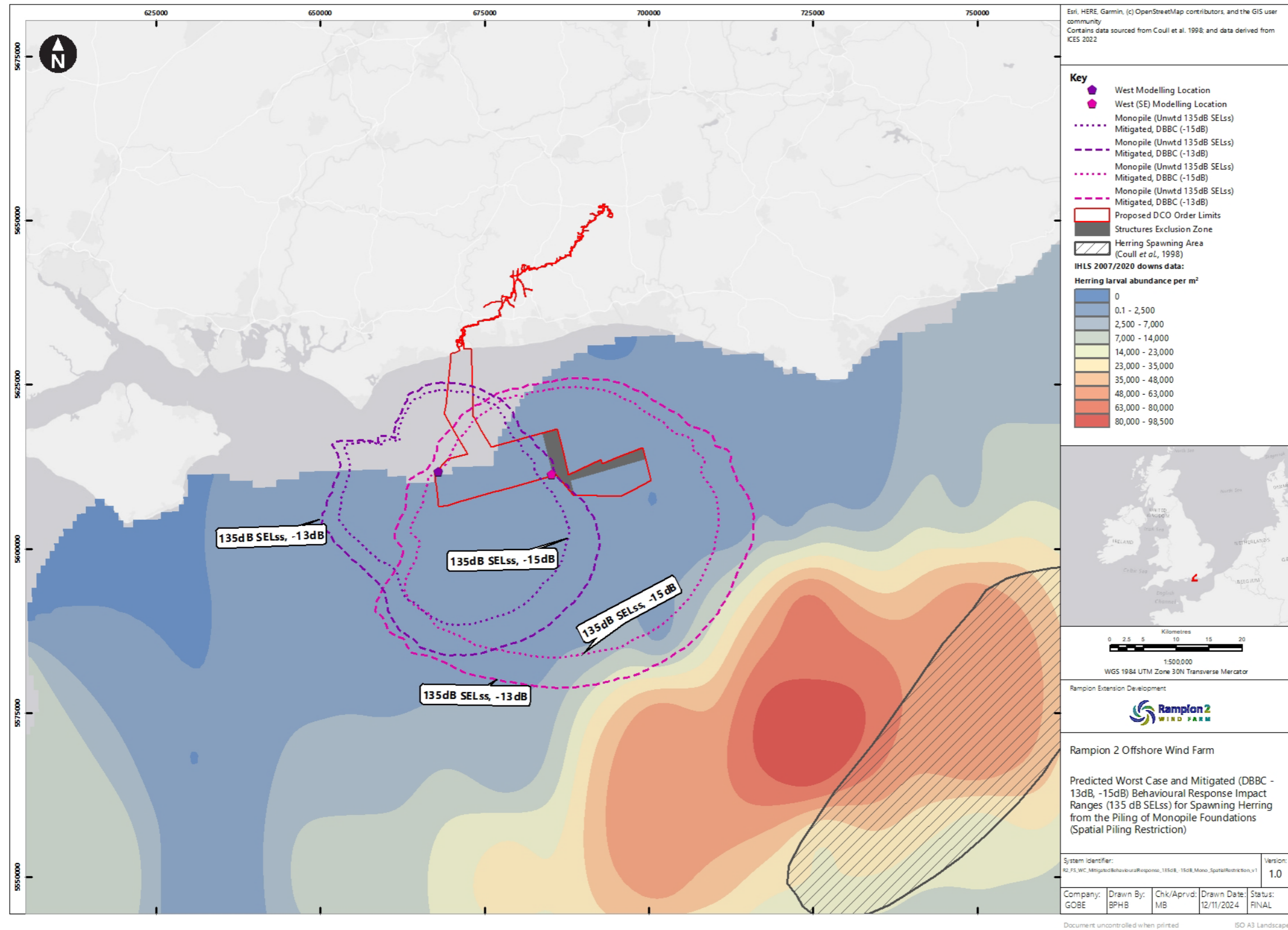


Figure 4: Outline Spawning Herring Piling Restriction Plan

