

# **Norfolk Boreas Offshore Wind Farm In Principle Habitats Regulations Derogation, Provision of Evidence**

Appendix 3 Haisborough, Hammond and  
Winterton SAC In Principle Compensation

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## 1 INTRODUCTION

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### 1.1 Background

1. In response to submissions made by Natural England and the MMO during the Norfolk Boreas Examination Norfolk Boreas Limited ('the Applicant') has committed to a number of mitigation measures that would address the potential effects of cable protection on the Haisborough, Hammond and Winterton (HHW) Special Area of Conservation (SAC). These are in addition to those which the Applicant has set out in the Information to Support Habitats Regulations Assessment (HRA) (document 5.3 [App-201]).
2. This specific mitigation and the justification for it is described in detail in the following documents:
  - The Haisborough Hammond and Winterton Special Area of Conservation Position Paper [REP5-057];
  - Additional information for the HHW SAC position paper [REP6-016];
  - Haisborough Hammond and Winterton SAC control document (document 8.20) [REP6-011 or REP6-017].
3. As stated in the position paper [REP-057], and in light of additional mitigation, the Applicant firmly maintains that an Adverse Effect on the Integrity (AEoI) of the HHW SAC will not occur. However, question Q3.8.6.1 posed by the Examining Authority (ExA) in the Norfolk Boreas Examination's third round of written questions requests that the "*Applicant presents a derogation case for the Alde-Ore Estuary Special Protection Area (SPA), Flamborough and Filey Coast SPA and the Haisborough, Hammond and Winterton (HHW) Special Area of Conservation (SAC) European sites.*" In order to respond to this question, the Applicant has prepared an in principle derogation case which is presented in the main document [ExA.Dero.1.D7.V1]. This Appendix (3) outlines in-principle compensatory measures that could be developed should the Secretary of State (SoS) conclude that an AEoI on the HHW SAC cannot be ruled out and compensatory measures are required. In principle compensatory measures for the Flamborough and Filey Coast and the Alde-Ore Estuary SPAs are provided in Appendix 1 and Appendix 2.
4. A request for Information was also issued by the Department for Business, Energy and Industrial Strategy (BEIS) to Norfolk Vanguard Limited on 6 December 2019 which invited Norfolk Vanguard Limited (albeit in the absence of any further mitigation measures) to: *provide any in-principle compensatory measures proposed to ensure that the overall coherence of the network of Natura 2000 sites is protected.*

5. Notwithstanding the Applicant's approach to present in-principle compensatory measures, this should be considered subject to the Applicant's clear and firm position that identifiable and certain mitigation measures are proposed to address AEoI on HHW SAC features associated with habitat loss, and that these mitigation measures can be appropriately secured through the DCO and relevant outline plans to be certified. However, in response to the ExA's request that the Applicant presents a derogation case, and having due regard to the SoS's request to Norfolk Vanguard Limited, this document provides the Applicant's submission in relation to in principle compensatory measures for habitat loss within the HHW SAC for the Norfolk Boreas project. As explained further in section 3 the Applicant has only proposed in-principle compensation for habitat loss and not habitat disturbance as disturbance would only be temporary and full recovery would be expected.
6. Although this document is informed by Norfolk Vanguard's response to the SoS's request, it provides in principle compensation for Norfolk Boreas alone. Should compensation be required for both projects, this could be secured individually through each project's DCO. However, given the shared cable corridor and the nature of the sister projects, the potential to deliver overarching strategic compensation for these impacts has been taken into account. Where relevant, preliminary consideration of how this could be achieved is provided within section 4.

## 1.2 Purpose of this Document

### 1.2.1 Context

7. A Request for Information from the Department for Business, Energy and Industrial Strategy (BEIS) to Norfolk Vanguard Limited on the 6 December 2019 also invited Norfolk Vanguard Limited, in relation to the qualifying Sandbank and reef features of the HHW SAC to provide information on any in-principle compensatory measures proposed to ensure that the overall coherence of the network of Natura 2000 sites is protected, albeit "in addition to/alternatively" to provision of further mitigation measures.
8. This document therefore provides a review of a range of potential measures for Norfolk Boreas that could be adopted to compensate for the potential effects of cable protection on the HHW SAC features. This range of compensation measures has been discussed with Natural England and the Marine Management Organisation (MMO) (detailed below) and their feedback incorporated where appropriate.
9. However, it should be noted that the Applicant does not believe that any compensatory measures will need to be progressed due to the delivery of specific mitigation measures committed to by the Applicant which provide certainty that

AEoI on the HHW SAC can be avoided. Therefore, the provision of evidence regarding in principle compensation measures is without prejudice to the Applicant's position that there will be no AEoI on the HHW SAC.

10. In addition, the advantages and inherent compensation value which renewable energy has the potential to provide for the Natura 2000 network should be acknowledged; with climate change representing the key pressure for a wide range of Natura 2000 qualifying features. It is however recognised that this is impossible to quantify and, therefore, these benefits are the focus of the Imperative Reasons of Overriding Public Interest (IROPI) case (discussed in Habitats Regulations Derogation Provision of Evidence, document reference ExA.Dero.1.D7.V1).

### 1.2.2 Consultation

11. The Applicant, jointly with Norfolk Vanguard, has undertaken extensive consultation with Natural England and the MMO in relation to possible compensation measures as outlined in the Appendix 4 consultation overview (document reference ExA.Dero.1.D7.V1.App4), as well as undertaking consultation with other relevant stakeholders.
12. As discussed in section 1.1 Norfolk Vanguard Limited was invited to provide a derogation case, and this was provided to the SoS on 28 February 2020<sup>1</sup>. Norfolk Boreas and Norfolk Vanguard have been developed strategically since their inception and as such share an offshore cable corridor which overlaps with the HHW SAC. Therefore, the in-principle derogation cases, and thus compensatory measures have been developed together following consultation with Natural England, the MMO and other stakeholders.
13. In relation to compensatory measures, draft in principle compensatory measures were provided to Natural England and the MMO on 17 January 2020 in order to seek guidance on the effectiveness of the potential compensatory measures identified; in particular whether they would be sufficient to ensure that the overall coherence of the Natura 2000 network is protected.
14. Written feedback was provided to Norfolk Vanguard Limited (also relevant to Norfolk Boreas) from Natural England on 4 February and this has been taken into account in this document.

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<sup>1</sup> <https://infrastructure.planninginspectorate.gov.uk/projects/eastern/norfolk-vanguard/?ipcsection=docs&stage=6&filter1=Secretary+of+State+Consultation>

### 1.2.3 This document

15. Following this introduction, section 2 of this document provides a description of the HHW SAC. Section 3 quantifies the predicted effect of the Project on the HHW SAC. Section 4 considers the guidance on compensation and sets out in principle compensation measures for Norfolk Boreas and the HHW SAC, including how these measures may be secured and subsequently delivered.

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## 2 HAISBOROUGH, HAMMOND AND WINTERTON SAC

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### 2.1 Overview

16. The HHW SAC is located to the west of Norfolk Boreas, and the proposed offshore cable corridor will pass through the SAC to make landfall. The SAC is designated for Annex I Sandbanks which are slightly covered by seawater all the time and Annex I Reefs (*Sabellaria spinulosa*).
17. The sandbank ridges consist of sinusoidal banks which have evolved over the last 5,000 years and comprise of Haisborough Sand, Haisborough Tail, Hammond Knoll, Winterton Ridge and Hearty Knoll. Older sandbanks, Hewett Ridge and Smiths Knoll, that have formed over the last 7,000 years are present along the outer site boundary. The more geologically recent sandbanks of Newarp Banks and North and Middle Cross Sands are located in the south west corner of the SAC<sup>2</sup>.
18. The Joint Nature Conservation Committee (JNCC) HHW Site Details<sup>2</sup> state that, at the time of designation, *S. spinulosa* reef had been recorded on Haisborough Tail, Haisborough Gat and between Winterton Ridge and Hewett Ridge.

### 2.2 Conservation Objectives

19. Conservation objectives are set to ensure that, subject to natural change, the integrity of a site is maintained or restored, as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:
  - the extent and distribution of qualifying natural habitats and habitats of the qualifying species;
  - the structure and function (including typical species) of qualifying natural habitats;
  - the structure and function of the habitats of the qualifying species;
  - the supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
  - the population of qualifying species; and,
  - the distribution of qualifying species within the site.

#### 2.2.1 Favourable condition

20. 'Favourable condition' is the term used in the UK to represent 'Favourable Conservation Status' for the interest features of SACs. For an Annex I habitat,

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<sup>2</sup> <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030369>



Favourable Conservation Status occurs under the Habitats Directive<sup>3</sup> when (JNCC and Natural England, 2013):

- its natural range and the area it covers within that range are stable or increasing;
- the specific structure and functions, which are necessary for its long-term maintenance, exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its typical species is favourable.

21. Favourable condition of Annex I Sandbanks which are slightly covered by seawater all the time and Annex I Reefs is assessed based on the long-term maintenance of the following (JNCC and Natural England, 2013):

- extent of the habitat (and elevation and patchiness for reef);
- diversity of the habitat;
- community structure of the habitat (population structure of individual species and their contribution to the functioning of the habitat); and
- natural environmental quality (e.g. water quality, suspended sediment levels).

### 2.2.2 Existing pressures in the HHW SAC

22. The Standard Data form for the HHW SAC<sup>4</sup> reports the following pressures on the site:

- Mining and quarrying (low pressure).
- Exploration and extraction of oil or gas (high pressure).
- Utility and service lines (low pressure).
- Shipping lanes, ports, marine constructions (low pressure).
- Fishing (high pressure).
- Marine water pollution (low pressure).

### 2.2.3 Targets for achieving Favourable condition

#### 2.2.3.1 Annex I *S. spinulosa* reef

23. Natural England's Supplementary Advice Targets<sup>5</sup> of relevance to Norfolk Boreas for Annex I *S. spinulosa* Reef are outlined in Table 2.1.

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<sup>3</sup> Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora.

<sup>4</sup> <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=UK0030369>

<sup>5</sup>

<https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030369&SiteName=haisborough&SiteNameDisplay=Haisborough%2c+Hammond+and+Winterton+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=>

**Table 2.1 Supplementary Advice Targets for *S. spinulosa* of Relevance to Norfolk Boreas**

Attribute	Target
Distribution: presence and spatial distribution of biological communities	Restore the presence and spatial distribution of reef communities.
Extent of subtidal biogenic reef	When <i>Sabellaria</i> reef develops within the site, its extent and persistence should not be compromised by human activities, accepting that, due to the naturally dynamic nature of the feature, its extent will fluctuate over time.
	Restore the total extent and spatial distribution and types of reef (and each of its subfeatures).
Structure and function: presence and abundance of key structural and influential species	Maintain OR Recover OR Restore the abundance of listed species, to enable each of them to be a viable component of the habitat.
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.
Structure: population density	Restore the density of <i>Sabellaria</i> species across the feature.
Structure: species composition of component communities	Restore the species composition of component communities.
	Restore the species composition of the <i>Sabellaria</i> reef community.
Supporting processes: areas with conditions suitable for reef formation	Restore the environmental conditions in those locations that are known, or which become known, to be important for <i>Sabellaria</i> reef formation.
	Maintain the natural rate of sediment deposition.
	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat
	Maintain the natural water flow velocity to the subtidal <i>Sabellaria</i> reefs, to provide high levels of oxygen, sediment supply and food.

### 2.2.3.2 Annex I Subtidal Sandbanks

24. Natural England’s Supplementary Advice Targets of relevance to Norfolk Boreas for Annex I Subtidal Sandbanks are outlined in Table 2.2.

**Table 2.2 Supplementary Advice Targets for Subtidal Sandbanks of Relevance to Norfolk Boreas**

Attribute	Target
Distribution: presence and spatial distribution of biological communities	Restore the presence and spatial distribution of subtidal sandbank communities.
Extent and distribution	Restore the total extent and spatial distribution of subtidal sandbanks to ensure no loss of integrity, while allowing for natural change and succession.
Structure and function: presence and abundance of key structural and influential species	Maintain OR Recover OR Restore the abundance of listed species, to enable each of them to be a viable component of the habitat.
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.
Structure: sediment composition and distribution	Restore the distribution of sediment composition across the feature (and each of its sub-features).
Structure: species composition of component communities	Restore the species composition of component communities.
Structure: topography	Maintain the presence of topographic features, while allowing for natural responses to hydrodynamic regime, by preventing erosion or deposition through human-induced activity.
Structure: volume	Maintain the existing (where no previous evidence exists) or best-known (where some evidence exists) volume of sediment in the sandbank, allowing for natural change.
Supporting processes: sediment movement and hydrodynamic regime	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions.

### 3 QUANTIFICATION OF EFFECT ON THE HHW SAC

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25. In the Information to Support HRA Report [APP-201] the Applicant provides an assessment of both habitat loss and habitat disturbance for Annex I Sandbanks. Annex 4 of the Applicant's Additional information for the HHW SAC position paper [REP6-019]<sup>6</sup> provides an assessment of the effect of habitat loss on *S.spinulosa* reef. Habitat loss would be long term, for the expected 30 year duration of the project, whereas habitat disturbance would be temporary, for a maximum of a few months in any one location. Following habitat disturbance, the assessment concludes that a full recovery of the sandbanks features would occur within a short time period (in the order of a few days to a year) and with the mitigation to microsite around *S.spinulosa* reef there would be little or no effect on that feature.
26. Therefore, in principle compensatory measures would only be appropriate for long term habitat loss and not for temporary disturbance (as rapid recovery would occur). The only cause of long term habitat loss within the HHW SAC as a result of the project would be through the installation of cable protection and therefore the in principle measures provided within this document are designed to compensate for maximum amounts of cable protection which could be installed by Norfolk Boreas within the HHW SAC.

#### 3.1 Cable Protection Worst Case Scenario

27. The predicted worst case scenario set out below relating to the potential effect of the deployment of cable protection on the HHW SAC incorporates the new further mitigation proposed by the Applicant during the Norfolk Boreas Examination. It also takes account of the various mitigation commitments made prior to submission of the DCO application.

##### 3.1.1 Mitigation

###### 3.1.1.1 Commitments made in the Environmental Statement

28. In the Environmental Statement (ES) (document reference 6.1) submitted in support of the DCO application, the Applicant committed to use a High Voltage Direct Current (HVDC) export solution, rather than High Voltage Alternating Current (HVAC), in order to reduce the number of cables and cable protection required by

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<sup>6</sup> Effects of long term habitat loss on *S.spinulosa* reef were not assessed in the Information to Support HRA Report as the Applicant consider that as *S.spinulosa* reef is likely to colonise cable protection the feature would not suffer any overall loss of habitat. However, Natural England's position is that *S.spinulosa* reef established on artificial substrate cannot be defined as Annex I reef (see Natural England's Relevant Representation [RR-099]) and therefore further assessment of the potential effects of permeant or long term habitat loss is required. The Applicant completed the further assessment which is presented in Annex 4 of the Applicant's Additional information for the HHW SAC position paper [REP6-019]

the project. This results in the following mitigating features in relation to cable protection:

- There will be up to two cable installations instead of six for Norfolk Boreas (and the same for Norfolk Vanguard).
  - The potential quantity of cable protection required in the unlikely event that cables cannot be buried will be reduced due to the reduction in the number of cables.
  - The number of export cables required to cross existing cables and pipelines and its associated cable protection will be reduced.
  - The space required for cable installation will be reduced, increasing the space available within the cable corridor for micrositing to increase burial success and avoid constraints such as the presence of *S. spinulosa* reef.
29. An interim survey in 2020, pre-construction survey for the Norfolk Vanguard project to be undertaken approximately 24 months prior to Norfolk Boreas construction and a pre-construction survey for the Norfolk Boreas project to be conducted within 12 months of any cable installation works will be undertaken. The detailed cable route, including micrositing, will be determined based on the results of the interim and pre-construction surveys and must be agreed with the MMO, in consultation with Natural England, before any installation works can commence.
30. Cables will be buried where the substrate allows burial to a depth of at least 1m and appropriate burial tools will be selected, following the preconstruction surveys, in order to maximise cable burial success and minimise the requirement for cable protection.
31. A maximum of 5% of the cable length within the HHW SAC may require cable protection due to inappropriate ground conditions for burial. This has been reduced from 10%, as set out in the DCO application, based on evidence from an interim cable burial study (provided in Appendix 2 of REP6-011 or REP6-017).
32. In response to Natural England's Relevant Representation [RR-099] made to the Norfolk Boreas examination, the Applicant has made a commitment to not use cable protection in the priority areas to be managed as reef within the HHW SAC, unless otherwise agreed with the MMO in consultation with Natural England. This is explained further within the HHW SAC Position paper [REP5-057].
33. This commitment will ensure that no permanent habitat loss occurs in the priority areas that have been identified by Natural England in order to facilitate the recovery of *Sabellaria* reef to favourable condition.

### 3.1.2 Footprint of Cable Protection in the HHW SAC

34. The maximum total footprint of cable protection installed by Norfolk Boreas within the HHW SAC could be up to 0.032km<sup>2</sup> based on the following:
- 0.012km<sup>2</sup> as a result of up to six crossings for each of the export cable pairs (12 crossings in total) within the HHW SAC.
    - Each crossing could require up to 100m in length and 10m in width of protection.
    - Every effort is being made by the Applicant to reduce the number of crossings by removing disused cables where agreement can be reached with the cable owners. An out of service cable recovery agreement has been discussed with BT Subsea and Annex 3 of the Additional Information for the HHW SAC position paper, BT Cable Recovery Letter of Comfort [REP6-020] demonstrates the advanced stages of these discussions, with a formal agreement expected to be in place imminently.
  - 0.02km<sup>2</sup> as a result of up to 5% of the cable length in the SAC (2km of cable protection per cable pair, 4km in total) potentially requiring cable protection in the unlikely event that unsuitable ground conditions are encountered. A 5m width of cable protection could be required. **If required, this would only be deployed outside the priority areas to be managed as reef in the HHW SAC.**

### 3.2 Quantification of Effects

35. Annex 4 of the Additional information for the HHW SAC position paper [REP6-019] provides an assessment of the effect of cable protection on the Annex I Sandbank and Annex I Reef features of the HHW SAC. This demonstrates the Applicant’s position that there will be no AEoI. However, in order to facilitate consideration of an appropriate scale of compensation as a factor in determining the feasibility of deliverability, Table 3.1 provides a summary of the areas of potential habitat loss.

**Table 3.1 Quantification of potential habitat loss in the HHW SAC**

Feature	Quantification of Habitat Loss
Annex I Reef ( <i>S. spinulosa</i> )	<p>No cable protection will be deployed in the priority areas to be managed as reef that underpin the Eastern Inshore Fisheries and Conservation Authority (EIFCA) and Department for Environment, Food and Rural Affairs (DEFRA) fisheries management areas (discussed further in the HHW SAC Position paper [REP5-057].</p> <p>The extent of Annex I reef and the approach to cable routing will be determined by the pre-construction surveys which must be undertaken within 12 months of construction due to the ephemeral nature of <i>S. spinulosa</i> reef. Therefore, it is not possible to quantify the amount of overlap there will be (if any) between cable protection and Annex I Reef outside of the priority areas to be managed as reef at this stage.</p>

Feature	Quantification of Habitat Loss
	<p>In order to provide a highly precautionary prediction for the purpose of considering in principle compensation proposals, an unrealistic assumption has been made that all of the potential cable protection required in unsuitable ground conditions (5% of the cable length) will be placed on Annex I Reef.</p> <p>Where cable protection is required due to pipeline / cable crossings this is not considered to represent a loss of Annex I reef in accordance with Natural England advice that <i>S. spinulosa</i> reef growing on artificial substrate is not Annex I reef.</p> <p><b>In summary:</b> a worst-case habitat loss of 0.02km<sup>2</sup> is considered for the purposes of reviewing in-principle compensation.</p> <p>As explained above, there will be no loss of Annex I reef habitat in the priority areas to be managed as reef.</p>
Annex I Sandbank	<p>The maximum total habitat loss within the HHW SAC could be 0.03km<sup>2</sup>.</p> <p>This represents 0.002% of the 1,468km<sup>2</sup> area of the SAC and 0.003% of the 678km<sup>2</sup> area of subtidal sandbanks within the SAC.</p>
Total Annex I habitat loss	<p>It should be noted that the worst case scenarios for habitat loss on Annex I reef and Annex I Sandbank outlined in the rows above should not be added together.</p> <p>The maximum total habitat loss within the HHW SAC would be 0.03km<sup>2</sup>. This represents 0.002% of the 1,468km<sup>2</sup> area of the SAC.</p> <p>Of this maximum, a proportion (less than 0.02km<sup>2</sup>) could be on Annex I Reef (although this is unlikely) and/or some or all of the cable protection could be on Annex I Sandbank.</p>

36. Table 3.1 provides the maximum area of potential habitat loss for Norfolk Boreas alone. If constructed Norfolk Vanguard Limited would also create a 0.02km<sup>2</sup> area of habitat loss, thus the total area of habitat loss within the HHW SAC across the two projects would be 0.04km<sup>2</sup>. Whilst this document presents the compensation case for the Norfolk Boreas project only, if both projects are required to provide compensation then this would be delivered jointly by the two projects in a strategic manner as the impacts would be very similar.

## 4 COMPENSATION

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### 4.1 Guidance

37. Should the SoS conclude that, following the Appropriate Assessment, an AEoI on a Natura 2000 site(s) cannot be ruled out, that there are no alternative solutions and that there are IROPI, Article 6(4) of the Habitats Directive *“requires that all necessary compensatory measures are taken to ensure the overall coherence of the network of European sites as a whole is protected.”*
38. DEFRA (2012) and EC (2012 and 2018) explain that, for habitats, the overall coherence of the Natura 2000 Network can be maintained by:
- re-creation of a comparable habitat, which in time can be designated as a Natura 2000 site;
  - site creation or extension of an existing Natura 2000 site on comparable habitat; and/or
  - reduction of pressures on the feature within the affected site or as part of the wider Network.
39. The guidance provides an element of flexibility, recognising that compensation of a ‘like for like’ habitat and/or in the same designated site may not be practicable.
40. Compensation should not be used to address issues that are causing designated habitats or species to be in an unfavourable condition. This is the responsibility of the UK Government. For example, it would not be sufficient for the Applicant to support existing proposals by the EIFCA and DEFRA to designate fisheries closure areas in the HHW SAC in order to restore the condition of the site. However there may be options to expand on these measures (in circumstances where this would not otherwise occur) in order to provide additional project level compensation (discussed further section 4.2.3).
41. Ideally, compensation should be functioning before the effect takes place, although it is recognised that this may not always be possible, as stated in the EC Guidance (2012):
- “in principle, the result of implementing compensation has normally to be operational at the time when the damage is effective on the site concerned. Under certain circumstances where this cannot be fully fulfilled, overcompensation would be required for the interim losses.”*
42. In line with the guidance, indicative compensation options for the loss of subtidal Annex I habitat could include:



- Re-creation of a comparable habitat, such as:
    - Establish a new Annex I Reef.
  - Site creation or extension on comparable habitat, such as:
    - Extend the HHW SAC to encompass areas of Annex I Reef outside but proximate to the SAC and the introduction of appropriate management.
    - Extend the HHW SAC to encompass areas of Annex I Sandbanks outside but proximate to the SAC and the introduction of appropriate management.
    - Establish a new site (and appropriate management) for Annex I Reef at a location away from the HHW SAC.
    - Establish a new site (and appropriate management) for Annex I Sandbanks at a location away from the HHW SAC.
  - Reduction of pressures on the feature within the affected site or as part of the wider Network, such as:
    - Fisheries management through the reduction in fishing using intrusive methods.
    - Removal of disused anthropogenic infrastructure and marine litter.
43. This document relates to in principle compensation for Norfolk Boreas alone. However, should Norfolk Vanguard also be required to provide compensation then this could be delivered jointly by the two projects in a strategic manor.

## 4.2 Review of Potential Compensation Measures

### 4.2.1 Establish a new Reef feature

#### 4.2.1.1 Overview

44. There is little evidence that *S. spinulosa* reef can be established by human intervention successfully, however, compensation through the delivery of another biogenic reef could support increased biodiversity, comparable to the function of *S. spinulosa* reef. This recognises that, under the Habitats Directive, Article 17 reporting relates to Annex I reef as a whole and does not distinguish between different types of reef.
45. Following consultation with Natural England, the Applicant is aware that establishing a reef feature within the HHW SAC, other than *S. spinulosa*, would not be acceptable to them. Therefore, the area of focus for this potential option would be outside the HHW SAC on appropriate substrate.

46. JNCC<sup>7</sup> states that, in addition to *S.spinulosa*, the main species which form biogenic reefs in the UK are blue mussels *Mytilus edulis*, horse mussels *Modiolus modiolus*, the serpulid worm *Serpula vermicularis*, and cold-water corals such as *Lophelia pertusa*.
47. There is little evidence that *S.vermicularis*, *M. modiolus*, or *L. pertusa* can be established by human intervention successfully to form reefs or beds, however *M. edulis* is widely farmed and readily colonises exposed surfaces. It is, therefore, possible to seed new *M.edulis* beds or enhance existing beds in areas of suitable habitat.
48. *M.edulis* inhabits hard substrate in the intertidal to shallow subtidal zone. It would not, therefore, be possible to deliver this within the Order limits of Norfolk Boreas, which is predominantly characterised by soft sediment and in deeper waters. While it is noted that *M.edulis* is likely to colonise sections of the turbine and platform foundations, this would not be on a natural substrate and therefore would not be considered an Annex I habitat.
49. *Ostrea edulis* (native oyster) beds also support increased biodiversity and a recent study by the Dornoch Environmental Enhancement Project (DEEP) provides evidence of successful seeding of native oyster beds (Centre of Expertise for Waters (CREW), 2019). In accordance with Natural England's Norfolk Vanguard Deadline 1 submission [REP1-088 of that examination], the southern North Sea was covered by extensive native oyster beds historically. Therefore, native oyster beds could provide a natural biogenic feature and it can be expected that there will be suitable habitat for planting *O. edulis*.
50. While the OSPAR commission (2009) states that "*Oyster beds need to be included in the European Natura 2000 network by Member States, given that they qualify as one of the habitats of the Habitats Directive (reefs)*", currently, oyster beds are not included in the Habitats Directive, are not therefore Annex I habitat, and are managed by National legislation.

#### 4.2.1.2 Delivery mechanism

51. In order to deliver the planting of oyster beds, the Applicant could commission an appropriate academic body with experience and expertise in this field to undertake this initiative.
52. Should planting of oyster beds be deemed to be appropriate, commercial fishing in the vicinity of established native oyster beds would need to be limited and/or

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<sup>7</sup> <https://sac.jncc.gov.uk/habitat/H1170/>

restricted, and the mechanism for this would need to be agreed with the MMO, in order for additional planting to be successful.

53. Areas around the wind turbine and/or platform foundations could provide an opportunity for planting native oyster beds in locations that would experience limited fishing activity due to 50m advisory safety zones.

#### 4.2.1.3 Spatial scale

54. Should this measure be deemed to be appropriate, the extent of the area to be planted in comparison to the area lost to cable protection would be agreed with Natural England.
55. A 2:1 ratio of *O. edulis* to *S. spinulosa* may be appropriate in recognition of the fact that replanting is unlikely to be 100% successful. Based on this, an area of 0.04km<sup>2</sup> (4ha) would compensate if 0.02km<sup>2</sup> of cable protection (as a worst case) in the SAC is determined to be required following detailed design, and if this overlaps with Annex I reef. The DEEP project aims to plant a significantly larger area of 40ha of oyster bed within 5 years.
56. Table 4.1 proposes indicative areas of deployment around wind turbine foundations based on a conservative assumption of planting a 20m wide ring around the foundations, on the basis that there is unlikely to be fishing at this proximity to turbines due to navigational safety. In determining the areas of deployment, however, the size of an oyster bed(s) required to deliver a viable, self-sustaining population needs to be taken into consideration and, therefore, the numbers below are indicative at this stage.

**Table 4.1 Indicative areas of *O. edulis* deployment around foundations based on a total compensation area of 4ha**

Indicative foundation type	Foundation diameter (m)	Area of <i>O.edulis</i> per foundation based on a 20m ring around foundations (m <sup>2</sup> )	Number of turbines with <i>O.edulis</i> planting	% of total no. turbines
20MW turbine with gravity base	50	1885	21	23%
11.55MW turbine with gravity base	40	1571	25	16%
20MW turbine with monopiles	15	785	51	57%
11.55MW turbine with monopiles	10	628	64	41%

#### 4.2.1.4 Timescale

57. The initial phase of the DEEP project between 2017 and 2018 demonstrated up to 86% survival.<sup>8</sup> Based on this, should this measure be deemed to be appropriate, it is likely that planting at a sufficient scale could be undertaken in a relatively short timescale (e.g. approximately one year).
58. However, if the planting is to occur around infrastructure foundations within Norfolk Boreas, this would have to be delivered post construction. To account for the measure not being in place prior to the effect on the HHW SAC, a proportion of overplanting could be provided, in accordance with the EC (2012) Guidance discussed in section 4.1.
59. Alternatively, as the Applicant owns a number of other OWFs, an area within an existing OWF could be planted with oyster bed to deliver compensation for Norfolk Boreas. In line with the EC guidance on locating any compensation as close to the point of impact as possible (by contrast to taking action elsewhere), Kentish Flats offshore windfarm or Thanet offshore windfarm may be appropriate locations for this compensatory measure.

#### 4.2.1.5 Feasibility

60. As discussed in section 4.2.1.1, oyster beds are not an Annex I habitat and because of this, during consultation between the Applicant and Natural England, Natural England stated that oyster beds would not deliver coherence of the Natura 2000 network.
61. Therefore, due to the uncertainty associated with the acceptability and deliverability of this compensatory measure, the Applicant would not propose to progress this option.

### 4.2.2 Site creation or extension on comparable habitat

#### 4.2.2.1 Overview

62. There are various areas of Annex I habitat (including areas of subtidal sandbanks and reef) outside existing SACs that have been identified by Statutory Nature Conservation Bodies (SNCBs) which could be designated and managed as new SACs in order to deliver compensation.
63. The protection of currently unprotected Annex I reef and/or Annex I sandbank habitat anywhere in the UK could deliver compensation. However, a key opportunity for the HHW SAC would be to extend its boundary to encompass Annex I reef and Sandbanks outside but proximate to the current boundary (see Figure 4.1 and Figure

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<https://nativeoysternetwork.org/portfolio/deep/>

4.2). This would align with the EC guidance on locating any compensation as close to the point of impact as possible (by contrast to taking action elsewhere). The extension could then be covered by the existing Conservation Objectives and management measures for the HHW SAC.

#### 4.2.2.2 Delivery mechanism

64. An extension to the HHW SAC and/or designation of reef or sandbank Annex I habitat outside the boundary of the SAC would have to be delivered by Natural England in consultation with the JNCC, as well as DEFRA. The Applicant could provide support and assistance to this process in order to deliver compensation for the project. Further details on the deliverability of this measure are provided in section 4.3.
65. Based on consultation undertaken with Natural England in relation to these compensatory measures (outlined in the Consultation Overview, Appendix 4 (document reference ExA.Dero.1.D7.V1.App4), the Applicant understands that Natural England supports this measure in principle.
66. The same compensation measures were proposed by Norfolk Vanguard. If Norfolk Vanguard is not required to deliver this compensation, then the proposed measures could be taken forward by Norfolk Boreas. Alternatively, if both projects are required to provide compensation then this could be delivered jointly by the two projects since:
  - a. The magnitude of compensation which this would provide far outweighs both the individual and combined effects of the two projects; and
  - b. The two projects are 'sister-projects' being developed jointly within the Vattenfall Wind Power Ltd group.
67. Further detail on the proposed approach to delivery of this compensation is provided in section 4.3

#### 4.2.2.3 Spatial scale

68. The extent of the area to be designated in comparison to the area lost to cable protection would be agreed with Natural England. For Norfolk Boreas a large 10:1 ratio of designation extension to habitat loss<sup>9</sup> would recognise the fact that the addition of protection to existing habitat has a lesser value than direct habitat creation. However, Figure 4.1 and Figure 4.2 demonstrate the very small area associated with a 10:1 ratio<sup>10</sup> in the context of the wider HHW SAC. Therefore,

<sup>9</sup> That aligns with the compensation ratio provided for Maasflakte 2 (Voordelta SAC) (Schouten et al., 2008).

<sup>10</sup> A 200,000m<sup>2</sup> (0.2km<sup>2</sup>) extension to compensate for a loss of up to 20,000m<sup>2</sup> for the Norfolk Boreas project alone. An area twice this size could be designated to jointly compensate for Norfolk Boreas and Norfolk Vanguard.

consideration should be given to developing an area of an appropriate scale that could deliver benefits to Annex I habitat. An indicative proposed area for extension in this case is discussed in section 4.3.

69. As stated throughout, the compensation measures described within this document are specific to Norfolk Boreas only. However, should a scenario arise where compensation for both Norfolk Boreas and Norfolk Vanguard would be required, the area to be designated would be of a suitable size to compensate for the loss of habitat occurring as a result of both projects. In this scenario the area required to comfortably offset the area effected (using the 10:1 scale) would be 400,000m<sup>2</sup> (0.4km<sup>2</sup>) and thus double the area presented in Figure 4.1 and Figure 4.2).

#### 4.2.2.4 Timescale

70. The aim of this potential compensation measure would be to designate the site extension prior to the construction of Norfolk Boreas.
71. Recognising that DECC (2016) states that a notified possible SAC (pSAC) and Site of Community Importance (SCI) should be treated as if it has been formally designated or classified, it would be sufficient for the site to reach pSAC or SCI status prior to cable installation within the HHW SAC. Further details on the expected timescales of this process are provided in section 4.3.
72. An advantage of promoting an extension to the HHW SAC over identifying a new site for designation elsewhere, would occur in relation to the timeframe that would be required for site selection of a new SAC. The HHW SAC has clear areas of potential for extension where the Annex I reef and Annex I sandbank extend beyond the existing site boundary.
73. In the unlikely event that the extension to the HHW SAC does not achieve pSAC status prior to construction, the large potential spatial scale outlined above could provide a significant level of overcompensation for any interim loss and, as such, this would meet the requirements of the EC (2012) Guidance discussed in section 4.1.
74. A decision by the SoS on whether Norfolk Boreas will be required to provide compensatory measures is expected in November 2020, so this would allow four years to deliver the compensatory measures prior to offshore construction which is due to start in 2025. A decision by the SoS on whether Norfolk Vanguard will be required to provide compensatory measures is expected on the 1 June 2020. Should the outcome be that compensation is required for Norfolk Vanguard, any compensatory measures required could be delivered jointly.

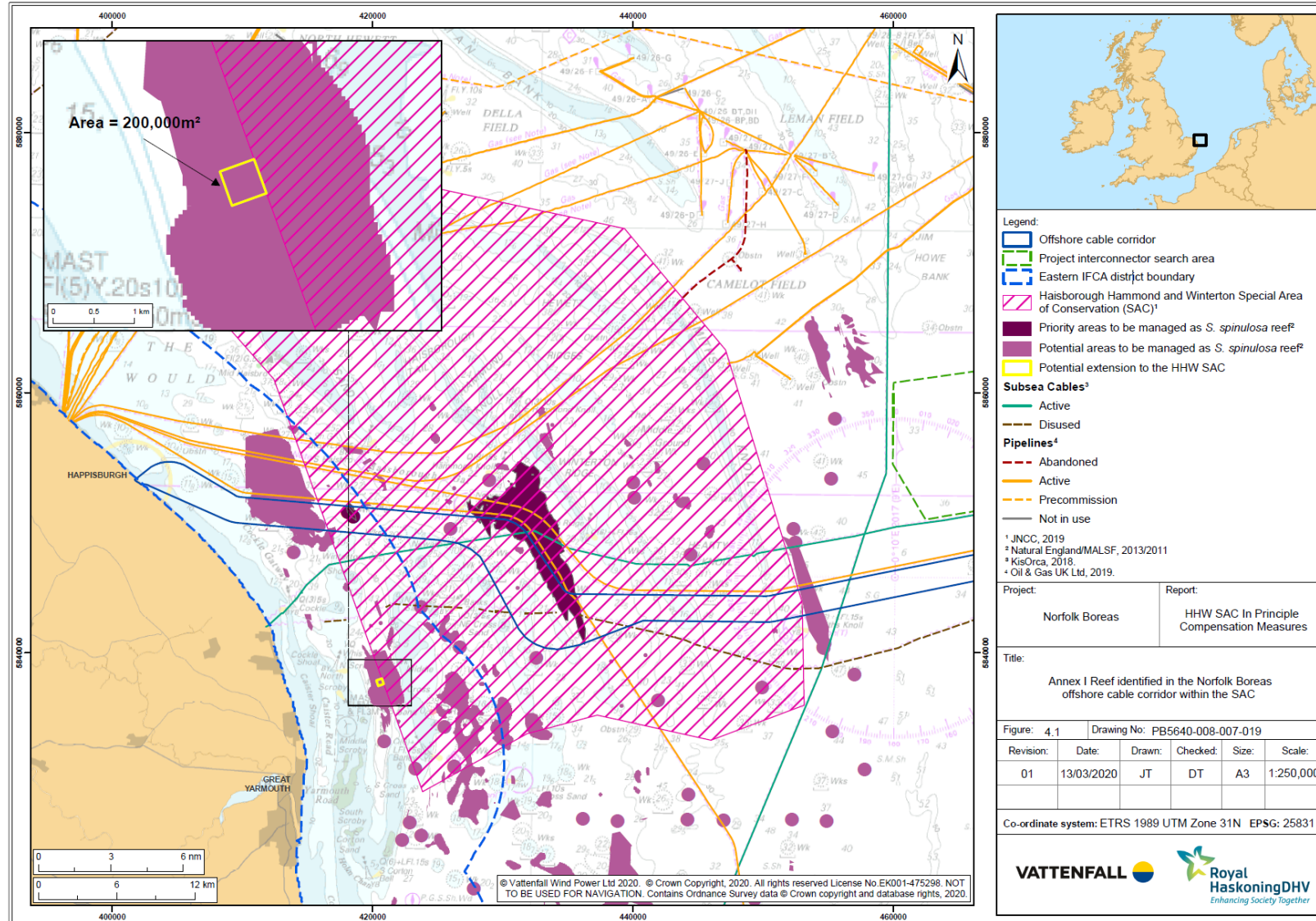


Figure 4.1 In Principle Compensation – Potential extension area to HHW SAC for Annex I reef

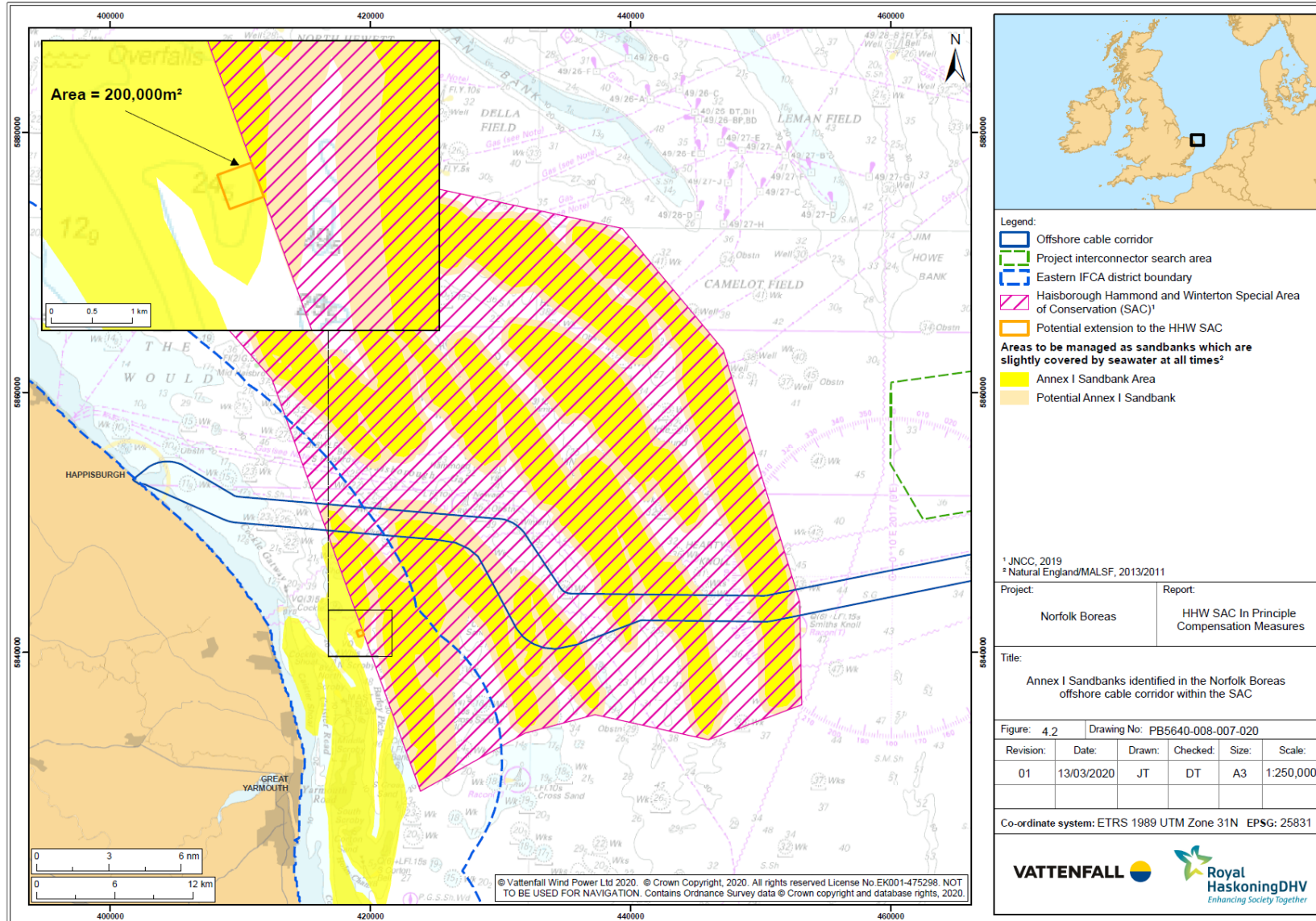


Figure 4.2 In Principle Compensation – Potential extension area to HHW SAC overlaid with Annex I sandbank



#### 4.2.2.5 Feasibility

75. The Applicant considers that an extension to the HHW SAC is a feasible measure and further details are provided in section 4.3.

### 4.2.3 Fisheries management – reduction of intrusive fishing methods

#### 4.2.3.1 Overview

76. As discussed in section 2.2.2, fishing represents a key pressure on the HHW SAC. This particularly relates to intrusive fishing methods such as beam trawling which can cause damage to Annex I sandbanks and Annex I reef.
77. As discussed above, the removal of pressures which are already contributing to the unfavourable condition of a Natura 2000 site is the responsibility of the Regulator. Therefore, any proposals for compensation need to go beyond measures which are designed for the recovery of features in unfavourable condition. Recognising that the EIFCA and DEFRA have proposed closures to bottom towed fishing gear in areas within the HHW SAC, the Applicant would need to support the delivery of an additional closure to intrusive fishing methods outside the boundaries of the proposed management areas shown in Figure 4.3 (that would not be otherwise delivered) or facilitate a reduction in intrusive fishing effort through purchasing fishing quotas in relevant areas.

#### 4.2.3.2 Delivery mechanism

78. The Common Fisheries Policy recognises that conservation measures which affect fishing interests may need to be adopted to comply with obligations in relation to environmental legislation<sup>11</sup>. Member States are allowed to adopt measures which do not affect other Member States under their own legislation, e.g. through bylaws under Section 129 (promoted by the MMO) and Section 155 (promoted by Inshore Fisheries Conservation Authorities) of the MCAA 2009. However, where conservation objectives would affect other Member States which have a direct management interest in the fishery, a joint recommendation must be made to the European Commission (EC) to adopt those measures. In summary, the process for a joint recommendation is as follows:
- a. Informal consultation between Member States;
  - b. Initiating Member State to provide information to other Member States;
  - c. Member States to then submit a joint recommendation to the EC;

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<sup>11</sup> Articles 11 and 18 of Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy

- d. EC to check the recommendation is in line with existing legislation, undertake an assessment of the proposal, and adopt any necessary measures;
  - e. Period for objections; and
  - f. Publication of the joint recommendation in the EU official journal.
79. The UK Government is therefore required to promote the Joint Recommendation as the initiating Member State. The purpose of the joint recommendation process is to meet the obligations under Article 6 of the Habitats Directive. Article 6 requires the establishment of necessary conservation measures (including through management plans) and avoidance of the deterioration of natural habitats. However, EC Guidance<sup>12</sup> states that compensatory measures should be additional to the actions that are considered normal practice under the Habitats and Birds Directives or obligations laid down in EU law, including the standard measures required for designation, protection and management of Natura 2000 sites.
80. At present, no authority has the jurisdiction to deliver fisheries management areas as compensation. An extension to a proposed fisheries management area or a new proposal would need to be facilitated by the UK Government in allocating appropriate powers to a relevant management body and, potentially, through the delivery of legislation to secure the necessary powers.
81. If this measure were to be considered further, baseline surveys would be required to confirm areas of suitable habitat and existing pressures to ensure areas identified for fisheries management have the potential to deliver benefits to Annex I habitat.

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<sup>12</sup> Managing Natura 2000 sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC – C(2018) 7621

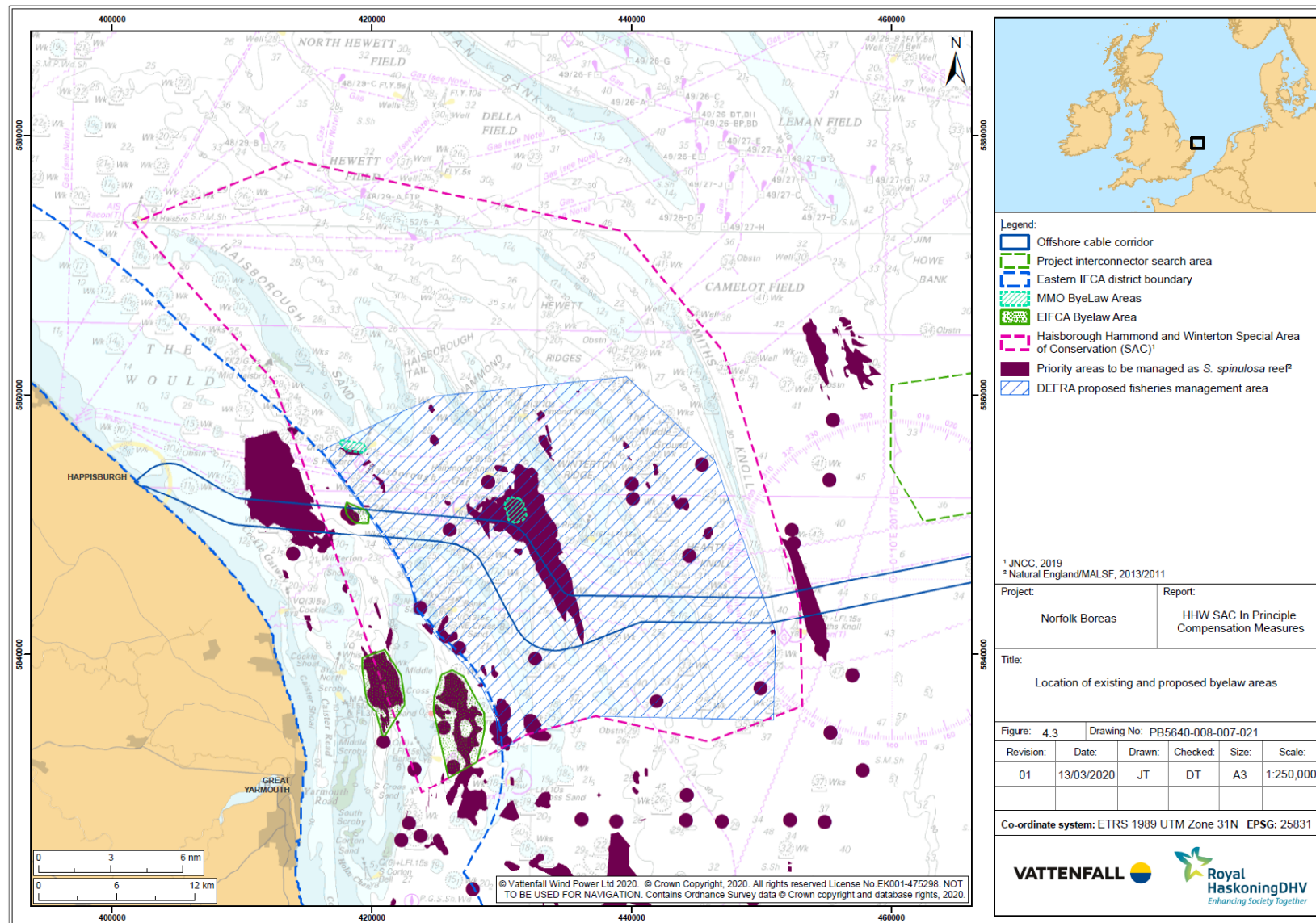


Figure 4.3 Existing and proposed fisheries management areas in the HHW SAC

82. Following the identification of suitable areas, the Applicant would financially support the process of developing a fisheries management measure in order to deliver compensation for the project, subject to the development of an authority having suitable powers to deliver this measure.

#### 4.2.3.3 Spatial scale

83. The extent of the area required to be closed to bottom-towed fishing gear in comparison to the area lost to cable protection would be agreed with Natural England.
84. A 10:1 ratio may be appropriate, recognising that a closure would not guarantee that the whole area achieves favourable condition. It is notable, however, that Natural England has high confidence that the EIFCA and DEFRA proposed closure areas will result in recovery of Annex I reef.
85. Based on this ratio, the designation of an area of 200,000m<sup>2</sup> (0.2km<sup>2</sup>)<sup>13</sup> would compensate if 20,000m<sup>2</sup> of cable protection (as a worst case) in the SAC is determined to be required following detailed design, and if this cable protection overlaps with Annex I habitat. This is significantly less than the following proposed EIFCA byelaw areas associated with the HHW SAC and consideration would need to be given to developing an area of an appropriate scale that could deliver benefits to Annex I habitat:
- Area 36 – 189.8ha (1.9km<sup>2</sup>);
  - Area 37 – 1401ha (14.0km<sup>2</sup>); and
  - Area 38 – 2237ha (22.4km<sup>2</sup>).

#### 4.2.3.4 Timescale

86. As discussed above, no authority currently has the jurisdiction to deliver fisheries management areas for the purposes of compensation and, therefore, this measure would require government intervention.
87. Given this, compensation through fisheries management is unlikely to be deliverable prior to construction of Norfolk Boreas.

#### 4.2.3.5 Feasibility

88. The feasibility of fisheries management measures to deliver compensation would be subject to the presence of Annex I habitat or habitat that has potential to become an Annex I feature following the removal of fishing pressures. This could include areas within or outside the HHW SAC where intrusive fishing methods are used. As shown

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<sup>13</sup> Should both Norfolk Vanguard and Norfolk Boreas be required to provided compensation this would likely amount to 400,000m<sup>2</sup> (0.4km<sup>2</sup>) to provide for both projects.

in Figure 4.3, areas that have the potential to become Annex I reef ('areas to be managed as reef') have been identified by Natural England. However, as noted above, at present no authority has the jurisdiction to deliver fisheries management areas as compensation. An extension to a proposed fisheries management area or a new proposal would need to be facilitated by the UK Government in allocating appropriate rights to a relevant management body and, potentially, through the delivery of legislation to secure the necessary rights. The feasibility of this measure is, therefore, currently uncertain and so the Applicant would not propose to progress this option.

89. The ability of the Applicant to purchase fishing quotas would be dependent on fishermen with appropriate quotas being willing to sell. The feasibility of this measure is, therefore, also uncertain and so the Applicant would not propose to progress this option either.

#### 4.2.4 Removal of disused anthropogenic infrastructure and litter

##### 4.2.4.1 Overview

90. As discussed in section 2.2.2, oil and gas infrastructure and utility and service lines represent key pressures in the HHW SAC. Based on advice from Natural England that artificial features hinder the development of Annex I habitats, the potential benefits of removing existing disused infrastructure could remove a pressure on the HHW SAC (that otherwise would not occur) in order to provide a compensatory measure.
91. In addition, most other SACs in the UK are likely to include disused anthropogenic features such as cables, pipelines, lost objects and fishing gear. Subject to being able to locate such objects, removal at another SAC could also provide compensation and help to ensure the overall coherence of the Natura 2000 network in the context of Annex I habitats.

##### 4.2.4.2 Delivery mechanism

92. Agreement from the owner of the disused infrastructure (where applicable) would need to be secured.
93. The method for removal would need to be agreed with Natural England to ensure that it did not have a greater impact on an Annex I feature. However, relevant removal measures are believed to be available.

##### 4.2.4.3 Spatial scale

94. The extent of the required area of debris removal in comparison to the area lost to cable protection would be agreed with Natural England.

95. A 1:1 ratio may be appropriate in this case, on the basis that this would be a direct like-for-like removal of infrastructure to compensate for the addition of new infrastructure. Based on this, an area of 20,000m<sup>2</sup> (0.02km<sup>2</sup>) would compensate if 20,000m<sup>2</sup> of cable protection (as a worst case) in the SAC<sup>14</sup> is determined to be required following detailed design, and if this cable protection overlaps with Annex I habitat.

#### 4.2.4.4 Timescale

96. Provided an agreement could be reached with the owners of disused infrastructure and the location of suitable infrastructure identified, this measure could be implemented between consent and construction. However, seabed surveys would first need to be undertaken (based on desk based assessment of likely 'hot spots') and these may need to cover an extensive area.

#### 4.2.4.5 Feasibility

97. Where existing infrastructure within the HHW SAC may be reaching the end of its life (e.g. the gas pipeline), it may be the responsibility of the owner to decommission this infrastructure if possible and therefore consideration would need to be given to whether this measure would provide a compensatory measure for Norfolk Boreas which is in addition to the existing requirements for the site.
98. In addition, depending on the type of infrastructure proposed for removal, the feasibility of lifting aging infrastructure and potential safety implications would need to be considered.
99. The Applicant is not aware of any known areas of small lost objects in the HHW SAC or surrounding area, such as fishing gear, that could be targeted and therefore there is high uncertainty associated with the practicality of finding and removing such objects. The Applicant has also consulted the EIFCA to confirm that there are no known areas that could be targeted with regards to lost fishing gear in this area. Therefore, this could require a significant level of survey data in terms of extent and resolution in order to locate suitable objects, and with the potential of no suitable finds.
100. Therefore, due to the uncertainty associated with the practicality of finding and removing infrastructure, the Applicant would not propose to progress this option.

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<sup>14</sup> Should both Norfolk Vanguard and Norfolk Boreas be required to provided compensation this would likely amount to 40,000m<sup>2</sup> (0.04km<sup>2</sup>) to provide for both projects.

### 4.3 Proposed Approach to Delivery of Compensation (if required)

101. If compensation is deemed to be required following the Appropriate Assessment, the Applicant proposes that an extension to the HHW SAC would be the most appropriate measure to deliver compensation for both Annex I reef and Annex I sandbank prior to the construction of Norfolk Boreas.
102. The measures which would be undertaken by the Applicant to promote an extension to the HHW SAC are as follows:
  - Agreement of the proposal to deliver an extension to the HHW SAC with Natural England, the JNCC and the DEFRA.
  - Provision of assistance in the development of an Area of Search in accordance with the JNCC Marine SAC Selection Process and Guidance<sup>15</sup>. This may be undertaken either by the Applicant or by a third party (e.g. Natural England) with financial support from the Applicant.
  - Provision of ongoing support to Natural England (and JNCC as required) to progress agreement of an extension boundary (including confirmation of the size of the extension) which can be submitted to the UK Government as a draft SAC (dSAC).
  - Once the proposal is accepted and progressed to a pSAC by the UK Government, the compensation would be deemed to be effective for the Project. However, the Applicant would provide ongoing support to progress the formal public consultation required for the site to reach SAC status. This is likely to take the form of funding for an appropriate person in Natural England or JNCC for approximately three to four years.
103. The aim of this potential compensation measure would be to designate the site extension prior to the construction of Norfolk Boreas. As discussed above, pSAC status would deliver compensation and the Applicant could commence its support of this process immediately post consent.
104. This compensation would be secured through the approval of a strategy by the Secretary of State, in consultation with the MMO and Natural England (see section 4.2.2.2). The strategy would need to be submitted to the Secretary of State for approval no later than 12 months prior to the commencement of any offshore works, and approved by the Secretary of State prior to the commencement of any offshore works. The strategy would include timescales for the measures to be delivered as well as proposals for monitoring and reporting on the effectiveness of the measures. Results from the monitoring scheme would need to be submitted to

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<sup>15</sup> [archive.jncc.gov.uk/default.aspx?page=4165](https://archive.jncc.gov.uk/default.aspx?page=4165)

the Secretary of State and Natural England, along with any proposals to address the effectiveness of the measures, which must thereafter be implemented as approved by the Secretary of State.

105. The precise size and location of the extension would be approved by the Secretary of State, in consultation with the MMO, Natural England, JNCC and DEFRA and would depend on the conclusions of the Appropriate Assessment regarding the area of any adverse effect, as well as confirmation of an appropriate scale of extension.
106. As identified in section 4.2.2.3, the appropriate area required to compensate for habitat loss caused by the Norfolk Boreas project is likely to be in the region of 200,000m<sup>2</sup> (0.2km<sup>2</sup>) (or 400,000m<sup>2</sup> for Norfolk Vanguard and Norfolk Boreas). Through discussions with Natural England, it has been determined that should an extension to the HHW SAC be required it may be preferable that, given the amount of work required, a larger (than the 0.2km<sup>2</sup> or 0.4km<sup>2</sup>) extension is designated. The known area of Annex I sandbank and Annex I reef that extends beyond the boundary of the HHW SAC, and thus the size of a suitable extension could be in the order of 120km<sup>2</sup> if required (shown in Figure 4.4). This possible area of extension is shown in Figure 4.4.
107. As discussed above, in the unlikely event that the HHW SAC does not achieve pSAC status prior to construction, this large potential spatial scale would provide a significant level of overcompensation (for both Norfolk Boreas and for Norfolk Vanguard) and, as such, this would meet the requirements of the EC (2012) Guidance discussed in section 4.1.
108. Given the requirement for formal consultation following designation to pSAC status, the Applicant acknowledges that there could be uncertainty as to whether the site would progress to full SAC status. As discussed above, classification as a pSAC would deliver compensation in the short term, however, if the consultation feedback is such that it is deemed unlikely that this measure would be secured in the long term, the Applicant would be responsible for identifying an alternative measure(s) which could include one or more of the measures discussed in sections 4.2.1, 4.2.3 and 4.2.4.
109. The same compensation measures were proposed by Norfolk Vanguard. If Norfolk Vanguard is not required to deliver this compensation, then the proposed measures would be taken forward by Norfolk Boreas. Alternatively, if both projects are required to provide compensation then this will be delivered jointly by the two projects since the proposed indicative area of 120km<sup>2</sup> provided would far outweigh both the individual and combined effects of the two projects (which is 0.04km<sup>2</sup>) as



this would be 300 times the size of the area required for compensation (even with the 10:1 ratio).

110. Under the scenario where both projects require compensatory measures Norfolk Boreas would work jointly with Norfolk Vanguard to deliver the measures to promote an extension to the HHW SAC, as presented in paragraph 102, strategically across the two projects. This would be logical and possible as the two projects are 'sister-projects' being developed jointly within the Vattenfall Wind Power Ltd group.

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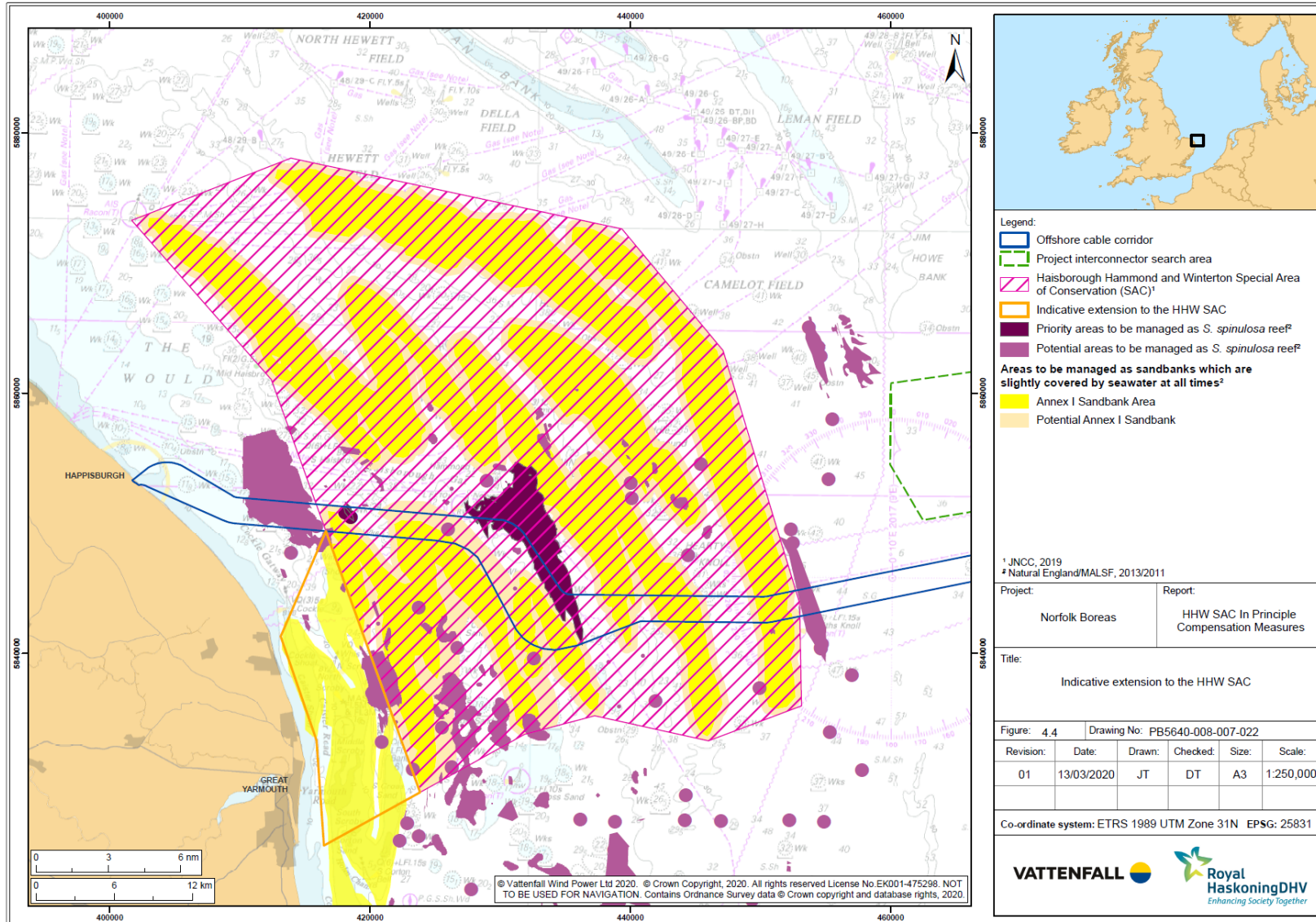


Figure 4.4 Indicative HHW SAC Extension area

#### 4.3.1 Monitoring

111. An advantage of this compensation measure is that, once designated, management of the extension could be aligned with the existing management of the SAC; providing long term efficiency. The Applicant could therefore provide funding for a proportion of the Common Standards Monitoring and/or initiatives to achieve favourable condition, proportionate to the size of area of habitat loss in comparison to the existing HHW SAC area.
112. Alternatively, the Applicant could extend the proposed post construction monitoring (outlined in the HHW SAC control document, document 8.20) to encompass the extension area (see Table 4.2).

**Table 4.2 Potential monitoring of extension in line with in principle post construction monitoring within the HHW SAC**

Receptor/s	Potential Monitoring
<b>Sandbanks</b>	A single survey within the Extension area using full sea floor coverage swath-bathymetric surveys undertaken to IHO S44ed5 Order 1a standard and side scan sonar surveys.
<b><i>S. spinulosa</i> reef</b>	<p>Where potential areas of <i>S. spinulosa</i> reef are identified during geophysical surveys, a single survey, specifically targeting those reefs identified would be undertaken using drop down video to confirm presence, extent and elevation.</p> <p>The duration over which monitoring of the Extension would occur would be aligned with the duration for post construction monitoring; the latter must be agreed with the MMO following review of the post-construction survey data.</p>

113. As provision of the measures to promote the extension, should both Norfolk Vanguard and Norfolk Boreas be required to provide compensation, the monitoring requirements would also be undertaken jointly by the two projects.

#### 4.3.2 DCO Condition

114. Schedule 19 of the draft DCO would be updated to include the following proposed condition to secure an extension to the HHW SAC as a compensatory measure if the Secretary of State is minded to conclude an AEoI on the HHW SAC:

#### *PART 3*

#### *Haisborough, Hammond and Winterton Special Area of Conservation: Promotion of an extension to the Haisborough, Hammond and Winterton Special Area of Conservation*

- 3. (1) No later than 12 months prior to the commencement of any offshore works, a strategy to promote an extension to the Haisborough, Hammond and Winterton**

*Special Area of Conservation must be submitted to the Secretary of State for approval, in consultation with the MMO and the relevant statutory nature conservation body.*

*(2) The strategy must be approved in writing by the Secretary of State prior to the commencement of the offshore works and must:*

*(a) accord with the principles contained in Section 4 of the Haisborough, Hammond and Winterton Special Area of Conservation (SAC) – In Principle Compensation Measures;*

*(b) include proposals for monitoring and reporting on the effectiveness of the measures; and*

*(c) include timescales for the measures to be delivered.*

*(3) The strategy must be carried out as approved, unless otherwise agreed in writing by the Secretary of State.*

*(4) Results from the monitoring scheme required under sub-paragraph (2)(b) including any proposals to address the effectiveness of the measures must be submitted to the Secretary of State and the relevant statutory nature conservation body, and any proposals to address effectiveness must thereafter be implemented by the undertaker as approved in writing by the Secretary of State.*

#### **4.4 Summary**

115. The Applicant maintains the position that Article 6(4) need not be engaged in relation to the HHW SAC as a result of Norfolk Boreas, as an AEoI can be ruled out. This is discussed further in the HHW SAC Position Statement (ExA; Pos; 11.D10.1).
116. Should the Secretary of State be minded to disagree with this position and conclude an AEoI following the Appropriate Assessment, the evidence presented in this document shows that there is at least one deliverable compensation measure.
117. Table 4.3 provides a summary of the compensatory measures that have been reviewed by the Applicant in consultation with Natural England and the MMO.
118. While there are a range of potential measures to compensate habitat loss, the Applicant proposes that an extension to the HHW SAC is the most deliverable within the timescales required for Norfolk Boreas. If Norfolk Vanguard is also required to provide compensatory measures this would be developed jointly with Norfolk Vanguard and could, if required, provide compensation for up to 300 times the combined effected area of Norfolk Boreas and Norfolk Vanguard.
119. The Applicant has set out how this compensatory measure could be secured within Schedule 19 of the draft DCO.

Table 4.3 Summary of In Principle Compensation Measures

Indicative Measure	Benefits	Delivery mechanism	Spatial scale	Timescale	Potential feasibility	Annex I habitat Compensated by Measure		Measure taken forward as compensation for Norfolk Boreas
						Sandbank	Reef	
Establish an Annex I reef at a location outside the HHW SAC	<i>O. edulis</i> or <i>M. edulis</i> beds would support increased biodiversity, comparable to the function of <i>S. spinulosa</i> reef. <i>O. edulis</i> and <i>M. edulis</i> beds are natural and native to the North Sea.	✓ In order to deliver the planting of biogenic reef/beds, the developer could commission an appropriate academic body with experience and expertise in this field. Need to ensure beds are not damaged by commercial fisheries.	✓ The scale would be agreed with Natural England. Need to plant areas which are of suitable size to become self-sustaining. A 2:1 ratio may be appropriate to recognise that replanting would not be 100% successful. Based on this, a maximum area of 0.04km <sup>2</sup> could be required. The DEEP project aims to plant a significantly larger area of 0.4km <sup>2</sup> of <i>O. edulis</i> bed within 5 years.	✓ If <i>O. edulis</i> beds were to be located within Norfolk Boreas this would be delivered post consent with a proportion of overplanting to compensate for not being in place at the time of the effect in accordance with EC (2012) and DEFRA (2013) Guidance. Alternatively, as the Applicant owns a number of other OWFs, an area within an existing OWF could be planted with oyster bed to deliver compensation for Norfolk Boreas. <i>M. edulis</i> translocation would not be feasible within the order limits of Norfolk Boreas, therefore the timescale for site selection is likely to be challenging.	? Technically feasible that <i>O. edulis</i> and <i>M. edulis</i> can be translocated based on existing evidence.  <i>However, O. edulis</i> is not deemed to be an acceptable measure by Natural England and <i>M. edulis</i> translocation would not be feasible within the Order limits of Norfolk Boreas, therefore the deliverability of this as compensation for Norfolk Boreas would be uncertain.	x	✓	x
Extend the HHW SAC to encompass areas of Annex I habitat outside the SAC	Only a very small extension required relative to the scale of the HHW SAC. Once designated, management of the extension could be aligned with the existing management of the SAC providing long term efficiency.	✓ Technical input and/or financial support to SNCB to progress agreement of a designation boundary extension by the UK Government. The Applicant would provide ongoing support to progress the formal consultation towards the site reaching SAC status.  If appropriate this would be developed jointly with Norfolk Vanguard	✓ The precise size of the extension would be approved by the Secretary of State, in consultation with the MMO and Natural England, and would depend on the conclusions of the Appropriate Assessment regarding the area of any adverse effect. However, it is anticipated that the size of the extension could be up to 120km <sup>2</sup> based on the known area of Annex I sandbank and Annex I reef that extends beyond the boundary of the HHW SAC.	✓ It is policy to consider early designations (including pSAC and SCI) as SACs in decision making. Therefore, it would be sufficient for the site to reach pSAC or SCI status in order for compensation to be in place. The Applicant could begin support for this process immediately post consent and it is expected that pSAC status could be achieved within 1 or 2 years of consent. The timescale to reach full SAC status and therefore the ongoing contribution from the Applicant is expected to be approximately 3 to 4 years.	✓ Existing mapping by Natural England shows areas of Annex I habitat beyond the HHW SAC that could be protected, therefore this measure is expected to be feasible.	✓ Annex I sandbank extends beyond the boundary of the SAC	✓ Annex I reef extends beyond the boundary of the SAC	✓
Fisheries management – Reduction in intrusive fishing methods such as bottom-towed trawling	Would represent a relatively small additional area further to existing proposals for fisheries management areas in the SAC.	✓ Financial contribution from the Applicant if this measure were adopted, calculated by reference to spatial scale of impact.	✓ The scale would be agreed with Natural England. For example, a 10:1 ratio may be appropriate – e.g. 0.02km <sup>2</sup> of habitat loss compensated by 0.2km <sup>2</sup> of extension to, or	? Long term/uncertain due to the absence of existing powers for an authority to deliver fisheries management areas for the purposes of compensation	? Currently no authority has the jurisdiction to deliver fisheries management areas for the purposes of compensation. The feasibility of this measure	✓ Fisheries represent a key pressure on Annex I sandbank in the SAC.	✓ Fisheries represent a key pressure on Annex I reef in the SAC.	x

Indicative Measure	Benefits	Delivery mechanism	Spatial scale	Timescale	Potential feasibility	Annex I habitat Compensated by Measure		Measure taken forward as compensation for Norfolk Boreas
						Sandbank	Reef	
	Approach for project compensation could be aligned with existing proposals for efficiency.	If appropriate the contribution could be made jointly with Norfolk Vanguard  Requires strategic input from the UK Government to develop legislation and a strategic fund to facilitate delivery of fisheries management.	new fisheries management areas.		therefore requires government intervention			
Removal of disused anthropogenic features	Direct like for like removal of pressure comparable to the pressure being added to the SAC.  Deliverable by the developer with minimal input from Regulator/SNCBs (compared with designating a SAC or fisheries management area)	? Agreement with owners of disused infrastructure. Survey to locate infrastructure. Agreement of method for removal with Natural England. Commissioning of removal.	✓ The scale would be agreed with Natural England.  For example, a 1:1 ratio may be appropriate in this case, on the basis that this is a direct like-for-like removal of infrastructure to compensate the addition of new infrastructure.	✓ Provided an agreement can be reached with the owners of disused infrastructure and the location of suitable infrastructure identified, this measure could be implemented between consent and construction.	? Need to agree removal with owners of the disused infrastructure.  Need to confirm feasibility, environmental consequences and safety of lifting aging infrastructure.	✓ Subject to the habitat type the infrastructure is located on	✓ Subject to the habitat type the infrastructure is located on	x

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