

# Norfolk Projects Offshore Wind Farms Benthic Implementation and Monitoring Plan



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*Photo: Kentish Flats Offshore Wind Farm*

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## Annexes to this report

Number	Name	Document Reference
Annex 1	DCO Benthic Compensation Schedules wording	Included at page 41 of this document
Annex 2	Norfolk Project Benthic Compensation Consultation report	PB5640.009.0007 (submitted as a separate document)
Annex 3	Marine Debris Identification Heat Mapping report (submitted as a separate document)	PB5640.008.0072 (submitted as a separate document)
Annex 4	Further information to support Education, awareness, and facilities to limit further marine debris	PB5640.008.0052 (submitted as a separate document)

## Glossary of Acronyms

AoS	Areas of search
BIMP	Benthic Implementation and Monitoring Plan
BSG	Benthic Steering Group
CSIMP	Cable Specification, Installation and Monitoring Plan
DCO	Development Consent Order
DDV	Drop Down Video
DML	Deemed Marine Licence
FLO	Fisheries Liaison Officer
IFCA	Inshore Fisheries and Conservation Authority
HHW	Haisborough Hammond and Winterton
KHz	Kilohertz
MBES	MultiBeam EchoSounder
NFFO	National Federation of Fishing Organisations
MMO	Marine Management Organisation
ROV	Remotely Operated Vehicle
SoS	Secretary of State*
SAC	Special Area of Conservation
SNCB	Statutory Nature Conservation Body
SSS	Side-Scan Sonar
WMP	Waste Management Plan

\* Formally for the Department of Business, Energy and Industrial Strategy and from the 7<sup>th</sup> February 2023 onwards the Department of Energy Security and Net Zero.

## EXECUTIVE SUMMARY

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Norfolk Vanguard and Norfolk Boreas offshore wind farms (collectively known as The Norfolk Projects) were both granted consent with the requirement to deliver benthic compensation. As stipulated within the Development Consent Orders, the Applicant (Norfolk Boreas Limited, Norfolk Vanguard Limited, and Norfolk Vanguard East Limited), has formed a steering group consisting of several key stakeholders in order to guide the delivery of the benthic compensation. The Plan of Works under which the steering group has operated was approved by the Secretary for State for Business Energy and Industrial Strategy<sup>1</sup> in September 2022 and the group has been working together since early 2022.

The Norfolk Projects benthic compensation requirements stipulate that an area of 8.3 hectares (per project) of marine debris should be removed from the Haisborough Hammond and Winterton (HHW) Special Area of Conservation (SAC), or if this is not possible then other locations elsewhere should be identified from which this quantum of marine debris should be removed. Analysis of existing data from the 42km<sup>2</sup> section of The Norfolk Projects offshore cable corridor which overlaps with the HHW SAC revealed that untargeted searches for marine debris were only likely to uncover very low densities of marine debris (approximately 0.15 items per km<sup>2</sup>). In order to improve upon this, The Norfolk Projects have undertaken an exercise to predict and map areas within the HHW SAC where marine debris is most likely to be present. Based on the results, two areas likely to exhibit the highest densities have been surveyed to identify debris present within them and it has been found that these areas are likely to contain debris at densities of up to 3.75 items per km<sup>2</sup>. One of the surveyed areas will form the primary location which will be targeted first for debris removal and a secondary area will be targeted should the first area not yield sufficient quantities of marine debris. Further search within the HHW SAC is not proposed as once away from the predicted higher density areas, the number of items per km<sup>2</sup> is likely to drop significantly, making debris removal ineffective.

Analysis of existing data has suggested removing 8.3 hectares (per project) of material from the seabed could be challenging as marine debris may not be present at sufficient densities to allow removal without incurring a significant carbon footprint, take a very long time, and if not done very carefully result in damage to the benthic communities and the integrity of the SAC. Therefore, although best efforts will be made through targeting the Primary Area of Search and then (if needed) the Secondary Area of Search, to remove the quantum required, other forms of adaptive management have been included within this plan to allow for the eventuality that success is not achieved during initial removal campaigns. Consequently, it is proposed that, should a reasonable portion of the 8.3 hectares have been removed following the Primary and Secondary area removal campaigns (for example more than 30%) within the HHW SAC, further work will occur within another SAC to attempt

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<sup>1</sup> As of the 7<sup>th</sup> February 2023 now the Department for Energy Security and Net-Zero

to remove more debris and meet the 8.3 hectares (per project) quantum required. However, should the HHW SAC removal campaigns be shown to be ineffective (for example they have resulted in the removal of less than 30% of 8.3 hectares per project target) then it is proposed that further marine debris recovery should not be undertaken as adaptive management and that this should instead take the form of a payment into the UK Government's "Marine Recovery Fund" (MRF) or suitable strategic compensation measure. The MRF is proposed to be legislated within the Energy Bill and is expected to be established by the second half of 2023. This approach is supported by Natural England and other bodies more recent advice that Marine Debris removal may not be the most effective way of providing benthic compensation.

Furthermore, should the actual effects caused by export cable installation be greater than predicted, the adaptive management measures would be increased accordingly (post cable installation). This would either be through an increase in the scale of the removal campaign carried out in another SAC or another separate payment into the MRF or suitable strategic compensation measure.

A further requirement of the benthic compensation is to deliver education, awareness and facilities to limit further Marine Debris. In collaboration with other organisations who aim to achieve similar objectives, The Norfolk Projects (with support of the BSG) have proposed a coordinated campaign to provide bins at fishing ports, facilitate the collection and recycling of unwanted fishing gear and meet with local fishermen to investigate what further could be done to increase the sustainability of fishing activities within the HHW SAC and its surrounding area. This element of the benthic compensation will commence in 2023 and will run for at least five years, taking it into the operational phase of the projects, thus delivering significant benefits to the marine environment for many years.

## 1 INTRODUCTION

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1. This document sets out the Benthic Implementation and Monitoring Plan (BIMP) for the delivery of the Norfolk Vanguard and Norfolk Boreas (collectively ‘The Norfolk Projects’) Benthic Compensation. The BIMP has been developed by The Norfolk Projects Benthic Steering Group (BSG).
2. The Norfolk Boreas and Norfolk Vanguard offshore wind farm projects are both being developed by Vattenfall Wind Power Ltd (Vattenfall). They are two separate projects with separate offshore sites; however, they share an offshore cable corridor and an onshore cable route. The Norfolk Projects are being developed together in a strategic manner in order to maximise efficiencies and ultimately reduce the cost to the consumer of green energy.
3. Norfolk Boreas was given consent in December 2021 followed by Norfolk Vanguard in February 2022. Due to the potential effects of the Norfolk Boreas and Norfolk Vanguard projects on benthic ecology (namely Annex I Reef and Annex I Sandbank) in the Haisborough, Hammond and Winterton (HHW) Special Area of Conservation (SAC) both projects are required to provide compensation.
4. This BIMP has been prepared pursuant to paragraph 29 of Schedule 19, Part 3 of the Norfolk Boreas Offshore Wind Farm Order 2021 (Norfolk Boreas Development Consent Order (DCO)) and paragraph 29 of Schedule 17, Part 3 of the Norfolk Vanguard Offshore Wind Farm Order 2022 (Norfolk Vanguard DCO) (together referred to as the Benthic Compensation Schedules) and this document serves to discharge the condition for both DCOs.
5. The wording of the conditions is very similar for both projects and has been used to develop the structure of this BIMP. The text of both Benthic Compensation Schedules is reproduced in Annex 1 of this document for reference.
6. The BIMP comprises two strands:
  - The identification and retrieval of Marine Debris (section 3); and
  - Education, awareness and facilities to limit further Marine Debris (section 4).
7. In summary, the Benthic Compensation Schedules state that the BIMP must include the following:
  - a) *details of any further survey work required.....* [Provided in section 3.4];
  - b) *details of the location, nature and size of material to be removed from the HHW SAC,...* [Provided in section 3.5];

- c) *a method statement for its removal, to include the vessel type, tools used and mitigation for how impacts on the surrounding habitat will be minimised* [Provided in section 3.6];
- d) *a programme of works for removal.....* [Provided in section 3.7];
- e) *proposals for monitoring in accordance with the principles set out in the HHW SAC compensation plan as well as proposals for reporting of monitoring* [Provided in section 3.9];
- f) *success criteria, adaptive management measures, details of alternative search areas outside the HHW SAC .....and details of further Marine Debris removal work that might be carried out if the actual effects of cable installation and protection on the HHW SAC are greater than anticipated* [Provided in Section 3.8];
- g) *programme of delivery for education, awareness and provision of facilities to reduce further Marine Debris from affecting the HHW SAC* [Provided in section 4 and section 3.7];
- h) *details of how all impacts to protected reef habitats within the HHW SAC will be avoided where possible* [Provided in section 5.2 ]; and
- i) *details of the locations for the disposal of dredged material, and evidence that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features, particularly reef habitats* [Provided in section 5.3].

## 1.1 Document development

- 8. This document has been updated in consultation with the BSG. The input from the BSG has helped shape and inform the scope and delivery of the BIMP.

## 1.2 Consultation

- 9. The BSG is comprised of representatives of The Norfolk Projects, Natural England, the Marine Management Organisation (MMO), The Eastern Inshore Fisheries and Conservation Authority (IFCA) and The National Federation of Fishing Organisations (NFFO). A chairperson, who is independent from the member organisations, has been appointed to oversee proceedings.
- 10. A consultation report is provided in Annex 2. This has been prepared as a record of all engagement with the BSG and other stakeholders which demonstrates the robust and collaborative consultation process that has been undertaken. All members of the BSG have had an opportunity to input to the process and the feedback received has been considered and acted upon where appropriate. An agreement log is being kept by the BSG and updated prior to and following each meeting. The agreement log at the time of submission of the BIMP is provided as Appendix 2 to the BSG consultation report (Annex 2).



## 2 SUMMARY OF PROPOSED COMPENSATION MEASURES

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11. Derelict abandoned, lost and discarded Marine Debris have been found to have profoundly adverse effects in the marine environment, including consequences such as “ghost fishing, transfer of microplastics and toxins into food webs, spread of invasive alien species and harmful microalgae, habitat degradation, obstruction of navigation and in-use fishing gear, and coastal socio-economic impacts” (Gilman et al., 2021).
12. In recent years there has been increasing international recognition of the need for multilateral efforts to address the detrimental effects of Marine Debris and abandoned, lost and discarded fishing gear (ALDFG) to reduce habitat alteration and degradation (Gilman et al., 2021).
13. For the purpose of the compensation requirement, ‘Marine Debris removal’ is specified as the removal of persistent anthropogenic material within the HHW SAC which has not been intentionally placed on the seabed, with the exception of recognised wrecks.
14. Examples of Marine Debris include discarded or lost fishing gear, dropped objects either from vessels or offshore structures, maritime disasters or illegally jettisoned waste.
15. The compensation measures required under the Benthic Compensation Schedules (see section 1) have been selected by the Secretary of State (SoS) to assist in the restoration of sandbank functionality and reduce potential pressures on Annex I Reef.

### 2.1 Overview of Compensation Strand 1: The identification and retrieval of Marine Debris

16. The Marine Debris removal campaign will focus on identifying items of Marine Debris (as defined in paragraph 13) that are on, or partially buried within the seabed of the HHW SAC and removing them if possible.
17. It is important to be pragmatic in determining what Marine Debris would be both practicably detectable as well as removable during the campaign, without causing further damage to protected features of the SAC.
18. In order to achieve removal of debris a three-phased approach is being applied:
  - a desk-based identification phase,
  - a survey phase, and then
  - a final removal from the marine environment phase.

19. The desk-based study was designed to predict where debris is likely to accumulate. This approach which is also known as “heat mapping”, was then used to identify a Primary Area of Search (AoS) and a Secondary AoS to specifically target areas with the highest likelihood of debris presence and therefore the highest likelihood of success.
20. This process of identification of Marine Debris is summarised in section 3 of this document and described in full in Annex 3. The Annex 3 desk-based study includes details of the methodology, justified rationale and a description of the data sources analysed to determine the AoS.
21. The Primary AoS was subject to geophysical survey in September 2022 and the data has been analysed (see section 3.5). The Secondary AoS has also been surveyed and data from that area has been subject to preliminary analysis and will be subjected to a full analysis if the Marine Debris retrieval from the Primary AoS does not meet the success criteria such that further recovery of Marine Debris is required.
22. Following this identification of suitable targets (a full list has been identified for the Primary AoS and a preliminary list identified from the Secondary AoS), debris will be removed from the seabed and disposed of onshore. The methodology for this process, including disposal onshore, is covered in section 3.6.

## 2.2 Overview of Compensation Strand 2: Education, awareness and provision of facilities to limit further Marine Debris

23. The second strand of measures from the Benthic Compensation Schedules is to undertake an education and awareness campaign with the provision of suitable facilities to reduce the creation of Marine Debris in the first instance.
24. In order to discharge this second strand, The Norfolk Projects are collaborating with the [East of England Plastics Coalition](#) (EEPC) Marine Debris Working Group to organise and deliver a scaled up iteration of a Marine Debris pilot project which the EEPC successfully delivered (Eunomia 2022). Full detail of this proposal is provided in Annex 4.
25. With a well-developed network within the fishing and recycling communities, good local geographical knowledge and a completed pilot project, the EEPC Marine Debris Working Group are well placed to support The Norfolk Projects with this strand of its compensation.
26. There is ongoing work being undertaken to refine the precise detail of this campaign, but work has commenced on core collaboration areas, and refining the strategy ahead of this campaign’s launch. Further detail is provided in section 4.

### 3 STRAND 1: IDENTIFICATION AND RETRIEVAL OF MARINE DEBRIS

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#### 3.1 Target Criteria

27. Prior to starting the work of identifying Marine Debris, a list of criteria for targets which has been developed in accordance with Natural England's advice on debris removal principles to avoid further impacts (June 2022), was discussed and agreed with the BSG. These are as follows:
- a) Only debris protruding from the seabed, or with a clear seabed impression, will be considered for removal (any material which does not protrude from the seabed will be difficult and damaging to remove);
  - b) Material protruding deeper than 1m into the seabed will not be removed (as this is likely to cause greater impacts on the seabed than the benefits gained by its removal);
  - c) Debris that has been colonised or is in the vicinity of Annex I Sabellaria reef would not be removed;
  - d) Targets will be larger than 1m in size as it will be difficult to establish what the targets are if they have a size of 1m or less, and their removal would cause a disproportionate amount of disturbance.

#### 3.2 Possible existing targets within the project boundaries and the HHW SAC

28. As the Norfolk Projects offshore cable corridor crosses the HHW SAC, survey data was collected during 2016 and 2020 campaigns from within the corridor. These surveys cover approximately 40.25km<sup>2</sup> of the HHW SAC (Illustrated in Figure 1 by the area of offshore cable corridor in blue which is located within the HHW SAC outlined in pink). Analysis of this data indicates that there are 13 possible targets, only 6 of which are likely to be Marine Debris<sup>2</sup> and when the target criteria described in section 3.1 is applied this number would be expected to reduce further. This exercise demonstrates that searching without direction would yield a very low number of possible marine debris targets (in this instance less than 0.15 targets per km<sup>2</sup>) and therefore work must be done to narrow down search areas before survey mobilisation to avoid ineffective surveys which are likely to have a very large carbon footprint for each item of marine debris retrieved. Therefore, The Norfolk Projects have undertaken the heatmapping work described in section 3.3 and deployed

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<sup>2</sup> It is not proposed that these possible targets from part of the Marine Debris removal campaign as due to the fact that their identification relies on data which is between three and seven years old and is in an area of highly mobile sediment it is unlikely that it will be possible to relocate them or remove them without causing disturbance to the designated features of the HHW SAC.

further survey campaigns set out in section 3.5 to identify higher densities of targets within the HHW SAC for a more efficient removal campaign.

### 3.3 Identifying areas for search

29. In order to identify and retrieve Marine Debris in the most efficient and environmentally sensitive way, a desk-based study was undertaken in July 2022 to establish the areas of likely Marine Debris accumulation within the HHW SAC (further detail is provided in Annex 3). This type of methodology was proposed and approved by the Secretary of State for the Hornsea Project Three benthic compensation which is required to compensate for the same features as the Norfolk Projects (Ørsted 2021).
30. The methodology uses a systematic, score-based approach using data to identify higher 'scoring' blocks measuring 1km<sup>2</sup> (i.e., areas with a greater perceived potential for containing a high density of Marine Debris as detailed in Annex 3) which were refined based on physical and biological parameters. This is also known as "heat mapping" with the higher scoring areas being "hotter" (and therefore identified as red or orange) than the lower scoring areas (identified as yellow or green). This enables the Project to specifically target areas with the highest likelihood of Marine Debris presence to maximise the volume of material recovered. Areas with a lower score are excluded from consideration due to the low likelihood of Marine Debris being present.
31. The exercise was completed using an agreed three-stage process (detailed in Annex 3) as follows:
  - **Stage One** involves eliminating areas within the SAC, due to constraints which will make surveying or eventual removal of debris unfeasible.
  - **Stage Two** relies on Marine Debris and proxy data being gathered and appropriately scored to reveal the highest scoring 1km<sup>2</sup> 'blocks'.
  - **Stage Three** uses conceptual analysis of the physical conditions within the SAC to refine the areas within the HHW SAC where Marine Debris is most likely to accumulate.
32. Following the output of the above mapping exercise, a Primary AoS was then selected from within an area of highest scoring blocks (Figure 1). This area was selected as it sits within an area of highest likelihood of Marine Debris and there are no known wrecks within it which may preclude Marine Debris retrieval due to archaeological reasons. However, it is surrounded by squares which do have wrecks present within them which could snag fishing gear leading to increased debris build up in the area.

33. In accordance with the approved method used by Hornsea Project Three (Ørsted 2021), a Secondary AoS (referred to as an adaptive management AoS within Annex 3) was also selected from a high scoring area (Figure 1). This secondary AoS was originally proposed as adaptive management, as at that stage it was not known how many debris targets were likely to be in the Primary AoS and therefore it was proposed that, should the success criteria (which also had not been finalised at that time) not be met in the Primary AoS, adaptive management would include removal from this area. The results from the subsequent survey work, as described in section 3.5, indicate that it is likely that Marine Debris removal will be required from this area and thus it is referred to in this document as the Secondary AoS rather than as adaptive management (see section 3.5 for further detail).
34. The Secondary AoS did not score as highly in the heat mapping as the Primary AoS, however, the Secondary AoS was positioned to also explore the potential for debris to accumulate in troughs (as set out by conceptual analysis of the physical drivers behind potential debris accumulation (see section 5.3 of Annex 3)). Natural England has advised that troughs are more likely to support Sabellaria reef and as a result the BSG are developing a decision tree (see section 3.6.1 for further detail on this) to ensure that reef features are protected from any potential effects of the Marine Debris removal process. The Secondary AoS has been located at a distance (approximately 10.5km) from the Primary AoS on the basis that, if a low number of targets were identified in the Primary AoS, and thus it was demonstrated to be incorrectly identified, choosing neighbouring squares may also result in low numbers. Whereas choosing an area in a different part of the SAC would increase the chances of finding higher densities of Marine Debris.
35. This process of identification of Marine Debris hot spots is described in full in Annex 3, this includes the detailed methodology and the data sources used to determine both the Primary and Secondary AoS.

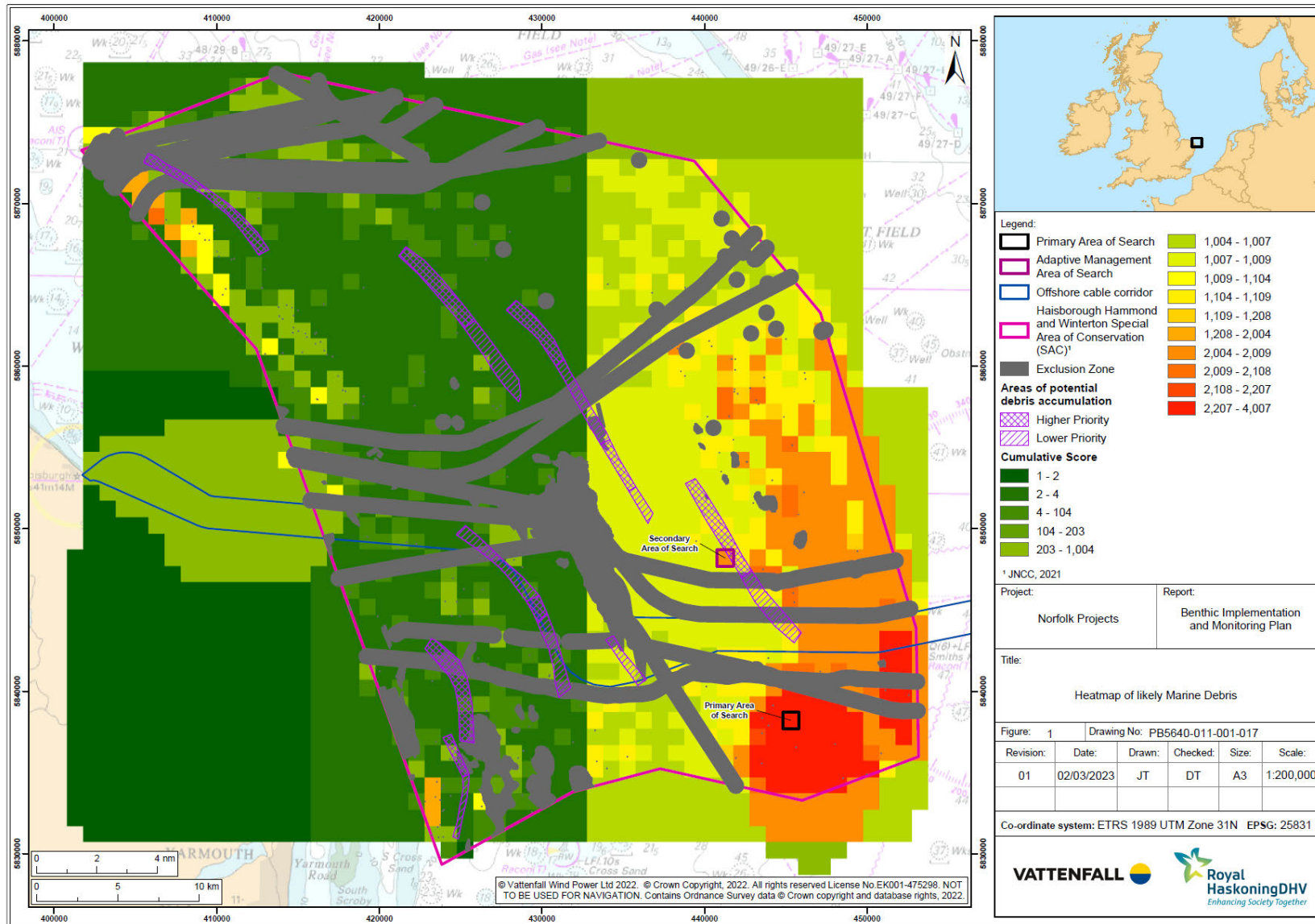


Figure 1 Heatmap of likely Marine Debris accumulation and identified Areas of Search (AoS)

### 3.4 Surveying the Areas for Search

36. High resolution geophysical seabed data (hull mounted Multibeam Echosounder (MBES) and towed side-scan sonar (SSS)) has been acquired during a survey in September 2022 to identify potential debris targets (or debris clusters) greater than 1m in size. The survey was designed to optimise resolution in both datasets. The equipment used comprise:
- MBES – Full coverage MBES bathymetry, minimum 20 soundings per 1m x 1m bin.
  - SSS – High frequency, min 500KHz, providing full seabed coverage, to include under-towfish gaps on adjacent lines.
37. The MBES and SSS data underwent preliminary processing offshore to identify targets greater than 1m in size. It should be noted that until a Remotely Operated Vehicle (ROV) investigation is undertaken as part of the removal campaign it will not be possible to be certain whether targets identified are Marine Debris or other seabed features (for example boulders).

### 3.5 Details of the location, nature and size of material to be removed from the HHW SAC

#### 3.5.1 Data Review & Target Assessment

38. The processed data has been provided by the geophysical contractor to The Norfolk Projects, alongside a technical note and associated spreadsheet summarising each target (to include its location and likelihood of being debris) with supporting imagery. This information will be reviewed by The Norfolk Projects and specialist contractors comprising a seabed removal expert, Benthic Ecologist, UXO Expert and Archaeologist.
39. Debris items that are present in sites of archaeological value (for example, debris associated with historic wrecks) will be excluded with 50m buffers applied to prevent accidental damage during debris removal.
40. Following the review there will be a refined list of targets (and coordinates) which will be progressed to the investigation and removal stage. In addition, any targets which were discounted from further investigation and rationale for their exclusion will be recorded to feed into the reporting for the success criteria of the compensation measure.

#### 3.5.2 Details of the targets

41. As a result of good weather conditions during the window of survey operations both the Primary and Secondary AoS were able to be surveyed as well as a large buffer

surrounding each area. This comprised a total area searched of just over 4km<sup>2</sup>. From the surveys carried out in September 2022, a number of targets have been identified in the Primary AoS and these are shown in Figure 2. Further interrogation of the data sets will be completed to attempt to identify more detail on each of the possible targets as described in section 3.5.1.

42. Analysis of the Primary AoS data set has revealed 12 targets within or in close proximity to the original Primary AoS, and of these 7 are thought to be potential items of Marine Debris with the rest having been identified as boulders. Additional survey carried out in the buffer around the original Primary AoS has yielded a further thirty-nine targets, of which 8 have been identified as potential items of Marine Debris with the rest having been identified as boulders and a wreck (Table 3.1). The Norfolk Projects propose to pursue all identified targets within or adjacent to the Primary AoS (the 15 red dots shown in Figure 2) and will remove as many of these as possible whilst remaining within the target criteria outlined in section 3.1 and using the decision tree protocol (described below in section 3.6.1.13.6.1.2) which will be developed and agreed by the BSG.
43. In comparison with the less than 0.15 targets per km<sup>2</sup> density of Marine Debris identified with the offshore cable corridor (see section 3.2) the Primary AoS has a much high density of 3.75 targets per km<sup>2</sup>.



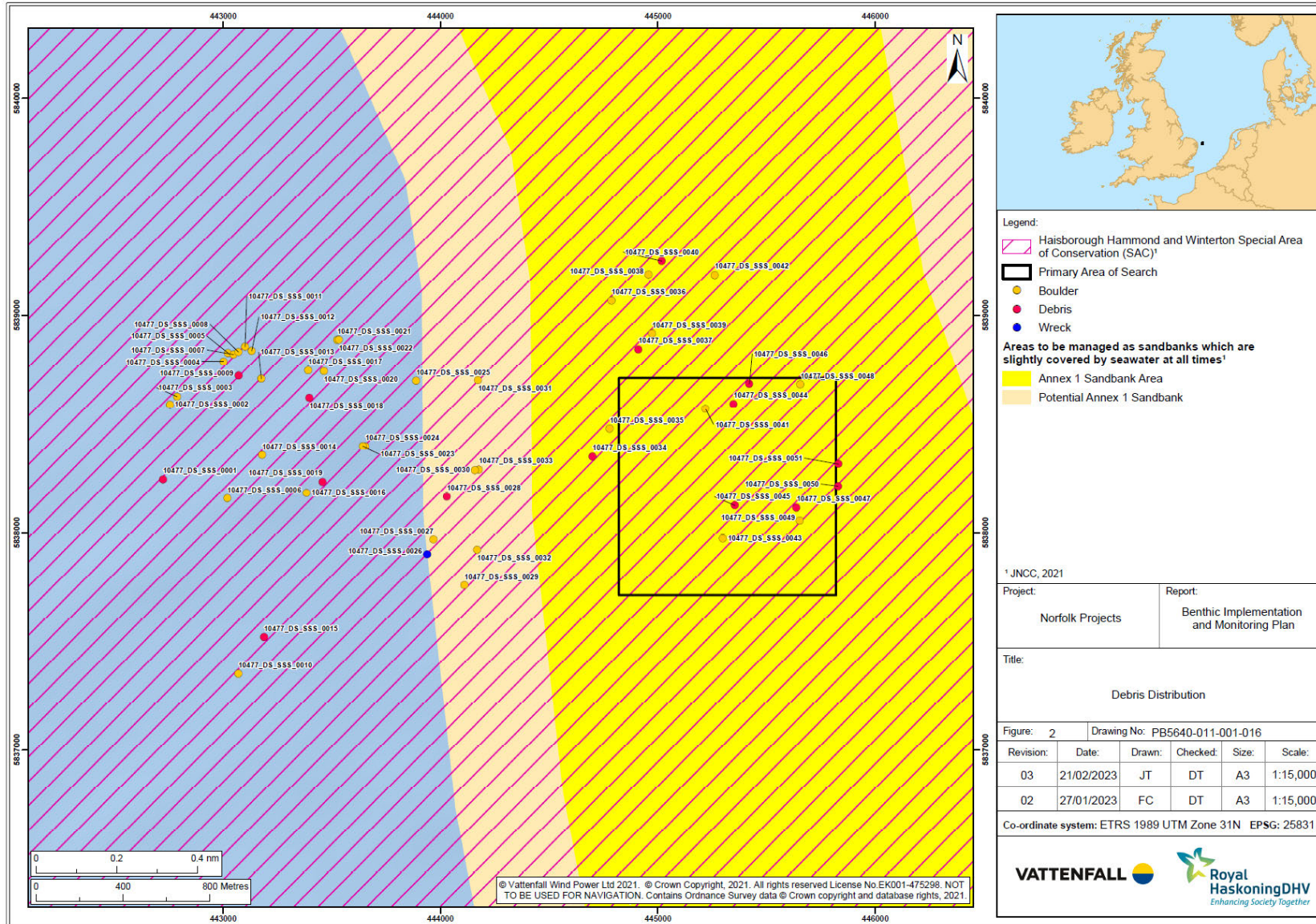


Figure 2 Marine Debris targets within and adjacent to the Primary Area of Search (AoS)

**Table 3.1: Initial Primary AoS Target Details**

Location		Target Type
X	Y	
443939.8	5837900	Wreck
445639.1	5838115	Debris
445654.8	5838056	Boulder
445657.2	5838681	Boulder
445263.7	5839186	Boulder
445300.7	5837972	Boulder
445421.7	5838685	Debris
445019.5	5839251	Debris
444958.9	5839189	Boulder
445350.1	5838591	Debris
444910.9	5838843	Debris
444788.4	5839068	Boulder
443888.7	5838699	Boulder
444778.9	5838478	Boulder
445356.1	5838126	Debris
445832.8	5838316	Debris
445830.4	5838215	Debris
444975	5838916	Boulder
444177.5	5838290	Boulder
444159.2	5838287	Boulder
444700.9	5838349	Debris
443968.5	5837966	Boulder
444030.3	5838165	Debris
444110.7	5837757	Boulder
444170.2	5837920	Boulder
444173.9	5838700	Boulder
445220.6	5838570	Boulder
443392.2	5838747	Boulder
443003	5838787	Boulder
443071.6	5837350	Boulder
443071.8	5838722	Debris
443102	5838856	Boulder
443131.7	5838837	Boulder
442788.9	5838626	Boulder
442756	5838589	Boulder
443020.1	5838157	Boulder
443023.4	5838827	Boulder
443048.3	5838821	Boulder
443177	5838709	Boulder
443179.9	5838356	Boulder

Location		Target Type
X	Y	
443070.5	5838831	Boulder
443189	5837519	Debris
443398	5838621	Debris
443384.7	5838183	Boulder
442723.8	5838245	Debris
443458	5838234	Debris
443525.1	5838887	Boulder
443533.1	5838888	Boulder
443655.9	5838398	Boulder
443643.4	5838399	Boulder
443464.9	5838743	Boulder

44. Data from the Secondary AoS has also undergone preliminary analysis, and this revealed twenty-one targets within or in close proximity to the AoS and these have been identified as 1 wreck, eleven ‘potential’ items of Marine Debris and 9 boulders. Further Analysis of the Secondary AoS data is being completed to allow for the eventuality that the Marine Debris removal campaign within the Primary AoS does not meet the success criteria (see section 3.8.1 for further information on success criteria).
45. It is not possible to provide certainty on the exact size and nature of the targets as this will only be known once the ROV has made visual contact with the target and the removal process has occurred. However, analysis of the MBES and SSS data indicates that the targets identified are likely to be relatively small, mostly in the region of a few meters squared in surface area. The fact that the survey has only resulted in the identification of 15 targets in the Primary AoS and that these are likely to be quite small, does highlight the challenging nature of meeting the success criteria set out in the DCOs. For example, even if all targets are successfully removed, based on the currently available information of likely sizes of targets, significantly less than one tenth of a hectare of debris would have been removed.
46. It is however very important not to pre-empt the results of the removal campaign in the Primary AoS as the targets identified may actually represent something much larger lying on the seabed than that which has currently been observed. For example the existing survey data may have detected a small part of what is actually a much more extensive piece of surface lying fishing gear (such as an otter board<sup>3</sup> attached to a large amount of netting which has not been detected by the MBES and SSS

<sup>3</sup> Otter boards or trawl doors are metal boards used to spread the mouth of fishing net whilst it is being towed behind a fishing vessel. These would be easily detected using MBES and SSS however any attached netting may not be.

equipment), the successful removal (see paragraph 52) of which would make a significant contribution to achieving the success criteria.

47. Information on the exact size and nature of the targets will be included within a report summarising the removal operations.

### 3.6 Method statement

48. Following the survey of the Primary and Secondary AoS and buffers, a removal campaign will be mobilised in early 2024 with the intention of removing as many of the 15 targets as possible whilst staying within the confines for the target criteria (described in section 3.1) and the decision tree (explained in section 3.6.1.1). If the success criteria are not met following the removal from the Primary AoS the campaign will move to the Secondary AoS and start to attempt to remove debris from that area. The type of vessel used and the equipment to be deployed for the debris removal are yet to be confirmed but they will be procured on the basis of their suitability to carry out the tasks detailed throughout this section.

#### 3.6.1 Investigation & Removal

##### 3.6.1.1 Target Investigation and decision making

49. Each of the 15 Marine Debris targets will be approached by an ROV installed on the ROV support vessel in a systematic order using the target list. Prioritisation may be determined by (in accordance with the procedure described in section 3.5.1), for example, the certainty of the nature of the targets or if there are clusters which could yield multiple successful targets.
50. The ROV will acquire video data of each target. The Norfolk Projects Supervisor, Benthic Ecologist, UXO Expert, Archaeologist and ROV Supervisor will review data from ROV cameras and decide if and how target recovery is to be attempted. This decision will be based upon several factors and will result in either proceeding to removal attempt (with agreement on the most appropriate tool) or an agreed exclusion due to sensitivity (for example areas of Annex I Sabellaria reef or items of archaeological interest) or contractor expertise (risk assessment).
51. A detailed decision tree will be developed with input from all specialists and the ROV contractor (and agreed with the BSG) to show how the decision for each target will be made, including avoidance of Annex I habitats. The decision tree will be submitted to the MMO as part of the marine licensing process in advance of the removal campaign and will be subject to agreement with the Statutory Nature Conservation Body (SNCB) through the marine licensing process.
52. Only debris protruding from the seabed, or with a clear seabed impression, will be considered for removal. The ROV will be mobilised with either a water jet or a pump

tool to allow for limited movement of sediment around debris, approximately up to 1m depth of seabed material. Estimated degree of burial and whether to attempt recovery will be assessed on the vessel by offshore supervisors, and the ROV Supervisor.

53. If a target is confirmed for recovery, those recovery operations will commence immediately to minimise the likelihood of the target moving or becoming further buried in sediment.
54. Once it has been confirmed that the target is suitable for removal a measurement will be made by the ROV operator of the footprint which the Marine Debris occupies on the seabed. This measurement will be used to quantify the area of Marine Debris removed during the campaign which will be used to determine whether the success criteria, defined in section 3.8.1 has been met.
55. If the success criteria are not met through debris removal from within the Primary AoS, then the removal campaign will relocate to the Secondary AoS (which was surveyed for target identification at the same time as the Primary AoS, see section 3.3).

#### 3.6.1.2 Removal

56. If a target is confirmed as viable for recovery, the contractor will attempt retrieval using a method appropriate to the type, size, and weight of the debris item. There are several options for recovery:
  - ROV: manipulators can lift an item up to 150kg in weight and of a size which the ROV manipulators can manage.
  - Vessel crane with grab attachment: weight capabilities will depend upon water depth, and there will be limitations in terms of debris length. This would be operated via deck controls with the potential for monitoring from a ROV should very controlled movements be required.
  - Vessel winch: can be utilised for debris of any length such as wires and chains to a weight of up to 150 tonnes. Debris is reeled in directly onto the vessel deck and this option will only be utilised for larger debris targets which the ROV cannot be used to bring onboard.
57. Although there may be some flexibility around the options listed above the ROV will be the preferred option (as this is the most controlled) unless the size or weight of the debris means that the ROV would require assistance from a crane, grab or winch.
58. Where the crane or winch is used, the connecting cables will be mobilised and attached to the debris target using the ROV hook or another method for the ROV to connect the recovery cable with the Marine Debris using ROV manipulators. This

guidance of the removal tool to the debris item by the ROV will ensure a controlled and highly targeted removal process.

59. Lifting capabilities of ROV, crane and winch equipment are anticipated to facilitate recovery of targets of considerable weight. However, recovery from seabed and onboarding onto deck of very large items may not be feasible.
60. A jet or pump tool on the ROV may be utilised to remove surface material on or around the debris to expose a connection point.
61. While the intention is to remove as many Marine Debris targets as are identified, given the potential health and safety implications, the decision to proceed with attempted removal of any target or to abort during recovery is at the sole discretion of the ROV contractor.
62. Examples of reasons to abort recovery include:
  - Level of HSE risk including potential for UXO.
  - Extent of target likely to be submerged below seabed (greater than 1m in depth).
  - Presence of Annex I Sabellaria reef.
  - Inability to securely connect lifting mechanism to target, e.g., due to size, weight, shape, orientation, material.
  - Excessive likely weight or size of target posing risk to lifting off seabed, onboarding to deck or storage on vessel.
  - Target identified as of potential archaeological interest.
63. Recovery operations will be deemed complete once all targets listed for inspection have been inspected and either recovered, left in situ, or left on the seabed following an aborted recovery. A field report will be provided summarising the operations and all associated data and rationale for the approach taken to each individual target. This report will feed into the monitoring and reporting of the success criteria of the compensation measure (see section 3.8). For clarity, once an object has been identified as Marine Debris and the decision tree has been followed to determine that retrieval should be attempted best efforts will be made to retrieve it, subject always to the ROV contractor's sole discretion (as explained above).

### 3.6.2 Disposal

64. Marine Debris will be lifted onto the vessel deck and stored appropriately according to HSE requirements as defined by the ROV contractor. The debris will be brought to shore for disposal or recycling (as appropriate). The ROV contractor will organise recycling options where they are available however as the debris is likely to be

heavily fouled, onshore disposal is considered to be the realistic option for the majority of debris collected.

65. A Waste Management Plan (WMP) for all debris removed will be developed and submitted alongside the Marine Licensing application for the debris removal campaign which will identify the appropriate disposal pathways.
66. Should any lost/unmarked fishing gear be retrieved that still has identification tags attached, then this information will be provided to the Eastern IFCA and the MMO to allow retrieval of gear by fishermen as opposed to disposal. The Fisheries Liaison Officer (FLO) on vessel will assist in the early identification of any lost/unmarked fishing gear retrieved and will be tasked with investigation of identifying ownership (if possible).

### 3.6.3 Strand 1 Compensation Discharge

67. Upon completing the removal campaign and disposal of all Marine Debris landed (see section 3.8.1 for detail on success criteria) the benthic compensation will be delivered if it has reached its success criteria (see section 3.8.1). In this situation the associated conditions of the Benthic Compensation Schedules will be discharged such that installation works on the export cables can proceed. At this point, the results will be reported to the BSG and the SoS would be notified so that the SoS can determine that the compensation has been delivered and the condition to provide compensation discharged.
68. However, if the success criteria outlined in section 3.8.1 is not achieved, then Adaptive Management Phase 1 would be implemented. Adaptive management (if required) will be delivered prior to export cable installation.

### 3.7 Programme of works

69. In order to deliver the targeted removal of 8.3ha (per project) of Marine Debris before any cable installation works take place in the HHW SAC (as required by the Benthic Compensation Schedules (Annex 1)), a programme for the Marine Debris removal in the Primary, and if required the Secondary AoS, has been proposed. This is shown in Figure 3 below, along with the expected programme of works for any adaptive management (if required) which will take place prior to export cable installation.

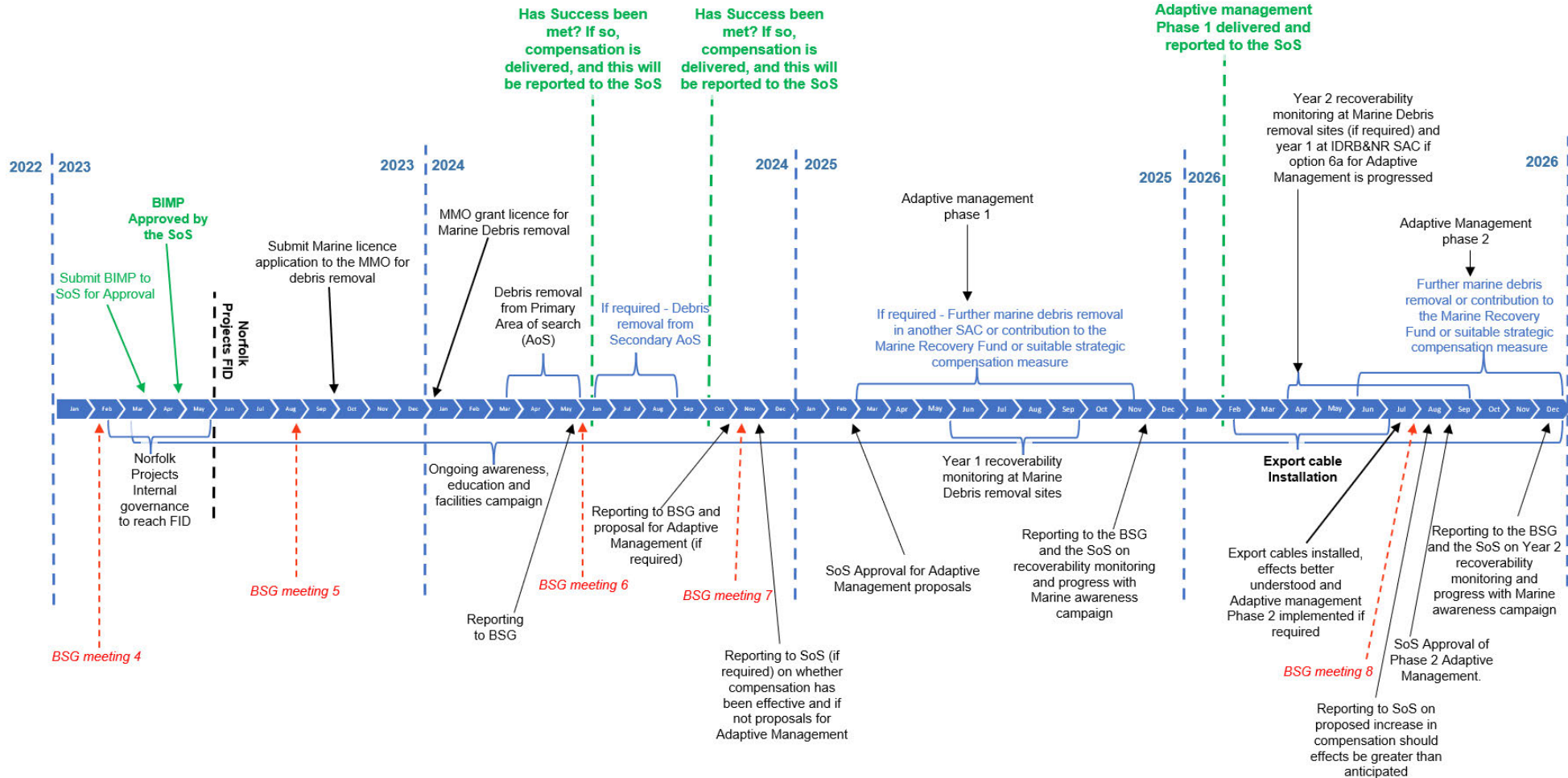


Figure 3 Programme of works for delivering benthic compensation (including adaptive management described in section 3.8.2 and the Marine Education and Awareness campaign described in section 4)



### 3.8 Campaign management

#### 3.8.1 Marine Debris removal success criteria

70. The success of the measures will be judged against two criteria:
- Firstly, the success of the desk-based assessment to propose Areas of Search which prove to have a high(er) density of debris (initial findings have indicated that this has been successful (see section 3.2 which indicated a target rate of less than 0.15 per km<sup>2</sup> in the offshore cable corridor and section 3.5.2 which indicates a target density of 3.75 per km<sup>2</sup>) in identifying Marine Debris, but this cannot be verified until further information relating to the nature of the debris (e.g. size/volume) is available from ROV investigation as part of the Marine Debris removal campaign); and
  - Secondly the area of debris removed in relation to the targets set out in the Benthic Compensation Schedules as 8.3ha per project (for Norfolk Boreas and Norfolk Vanguard, but taking into account the quantum of Marine Debris removal that might be delivered by virtue of the shared cable corridor). This will be calculated by measuring the footprint that each piece of Marine Debris occupied on the seabed before it was removed.
71. Regarding the second success criteria, Marine Debris, depending on its nature, will also have an area of influence greater than its immediate footprint, for example a scour pit, or if mobile, an area of disturbance. Therefore, using the method proposed above it could be concluded that The Norfolk Projects will be overcompensating by calculating only the area of seabed occupied.
72. Both of the above success criteria will need to be met for overall success of strand 1 to have been achieved and these criteria will be reported within the monitoring reports detailed under section 3.9. If the Primary and Secondary AoS do not yield sufficient debris, then there will be a requirement for adaptive management which is described in section 3.8.2.

#### 3.8.2 Adaptive management

73. There are two triggers which would lead to adaptive management being required which are:
- Trigger 1: the Primary (and Secondary) AoS success criteria discussed above are not met; and
  - Trigger 2: greater effects of cable installation and cable protection are seen than were assessed in the consent application.

74. This section outlines the adaptive management measures established to satisfy the discharge of the compensation schedules underpinning Strand 1 of this BIMP in the event that either (or both) of the triggers set out above occur.
75. See Figure 4 for an overview of the adaptive management process, which would be delivered in one, or two phases depending on the stage at which the success criteria are met.

#### 3.8.2.1 Phase 1 of Adaptive management

76. As summarised in Figure 4, Adaptive Management Phase 1, if triggered, would be in the form of one of two alternatives:
  - a) Searching alternative areas outside of the HHW SAC to identify and remove Marine Debris (in compliance with paragraph 29 (f) of the Benthic Compensation Schedules): or
  - b) Payment into the Marine Recovery Fund (MRF) or suitable strategic compensation measure.
77. The rationale for having two alternatives (termed 6a and 6b in Figure 4) for adaptive management is as follows. It is recognised that it will be challenging to achieve the success criteria within the HHW SAC then it may also be challenging in other SACs. Under this scenario, having exhausted reasonable attempts to remove Marine Debris, an alternative adaptive management measure would be required, and it is proposed that this would be a financial contribution to the MRF or suitable strategic compensation measure. The inclusion of two different options as adaptive management increases the chance of providing effective compensation.
78. However, if a suitable level of success to warrant further removal efforts (for example this could be approximately 30% of the 8.3ha required per project) had been achieved during the debris retrieval campaign in the HHW SAC, then there could be a reasonable chance of success of delivering the debris removal compensation through search in other areas outside the HHW SAC and therefore further search and retrieval campaigns would be warranted. Consideration of this following the planned retrieval campaigns allows the BSG to assess if further Marine Debris removal is likely to be effective and meet the required success criteria.
79. For either of the above options the adaptive management under Phase 1 (e.g., additional search in other areas or payment into the MRF or suitable strategic compensation measure) would be proportionate to the level of adaptive management required at that stage. This would be determined with the BSG and included in the proposals to be submitted for approval by the SoS late 2024 (see Figure 3 and Paragraph 81).

80. Further search and debris removal within the HHW SAC has not been proposed as an option for adaptive management as the Primary and Secondary AoS have been selected on the basis that they are most likely to contain the greatest quantity of Marine Debris. Attempting debris removal from other areas within the HHW SAC is likely to result in diminishing returns. Therefore, if further Marine Debris retrieval is the option taken forward as adaptive management, it has been determined that it would be more effective to search in a completely new area which may achieve better results.
81. As part of the monitoring required (see section 3.9) the outcomes of the debris removal campaign will be presented to the BSG at meeting 7 (see Figure 3). If the Debris removal campaign has been ineffective the report to the BSG will also recommend options for adaptive management. In accordance with paragraph 32 of the Benthic Compensation Schedules, proposals to address ineffectiveness will then be submitted to the SoS for approval in consultation with the MMO and the relevant statutory nature conservation body once agreed by the BSG.

#### 3.8.2.1.1 *Alternative 6a: New Area of Search*

82. Alternative 6a (see Figure 4) would involve undertaking the steps presented in sections 3.1 to 3.6 to identify new target areas within the Inner Dowsing, Race Bank and North Ridge (IDRB&NR) SAC for Marine Debris removal. The IDR&NR SAC has been chosen due to the fact that it is the only SAC which fulfils all of the following criteria:

- It has been designated for the same features as those in the HHW SAC (and therefore those which the Norfolk Projects would be affecting) and thus, debris removal from the IDR&NR SAC would be to the benefit of the network of Annex I Sandbanks and Annex I Sabellaria reef.
- It is located within the same geographical region (less than 20km from the HHW SAC) as the HHW SAC (i.e., the southern North Sea) and therefore would be compensating for effects close to the source of those effects.
- It has not already been targeted for Marine Debris removal by other projects as some SACs have, and subsequently these are likely to contain less Marine Debris.

#### 3.8.2.1.2 *Alternative 6b: Marine Recovery Fund or suitable strategic compensation measure*

83. Alternative 6b (see Figure 4) would involve a financial contribution by The Norfolk Projects to the MRF or suitable strategic compensation measure of a value that would be considered suitable to offset the effects of The Norfolk Projects on the designated features of the HHW SAC.

84. The BSG recognise that condition 29(f) of the Benthic Compensation Schedules refers to “*alternative search areas outside the HHW SAC*” and thus alternative 6a has been included above. However, analysis of data described in section 3.5 demonstrates that Marine Debris target densities are potentially low, even when surveying an area which has been identified as a likely Marine Debris hot spot. Therefore, it is important that an alternative adaptive management measure such as contribution to the MRF or suitable strategic compensation measure is available.
85. The MRF is a new industry-led Fund which will support delivery of strategic compensatory measures. The intention is for the fund to be operational and able to receive payments from late 2023 or early 2024.
86. The basis for setting up the fund is that “*commercial, competition and other project management information sensitivities can limit opportunities for developers to easily deliver strategic compensatory measures in collaboration with other developers. The Marine Recovery Fund is intended to be an optional route for wind farm developers to pay into, to discharge their compensation obligations*” (BEIS 2022).
87. The legislative mechanism for the MRF is expected to be included in the Energy Bill which is anticipated to receive Royal Assent in June 2023.
88. A library of potential projects for which the MRF will support is in development (overseen by the Collaboration on Offshore Wind Strategic Compensation (COWSC) group<sup>4</sup>) but is not yet available. However, The Norfolk Projects would seek to ensure that its contribution was used to support projects that most aligned with the effects on the HHW SAC as a result of The Norfolk Projects, such as those which maintained or enhanced the network of Annex I Sabellaria reef and Annex I sandbanks and their supporting communities.

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<sup>4</sup> COWSC brings together government representatives, Statutory Nature Conservation Bodies (SNCBs), environmental Non-Governmental Organisations (eNGOs) and industry across all four UK jurisdictions to work together in partnership. The Offshore Wind Industry Council (OWIC) and the Department of Environment, Food & Rural Affairs (Defra) are responsible for the COWSC secretariat functions, Defra chairs the COWSC Oversight Group and the COWSC Delivery Group is co-chaired

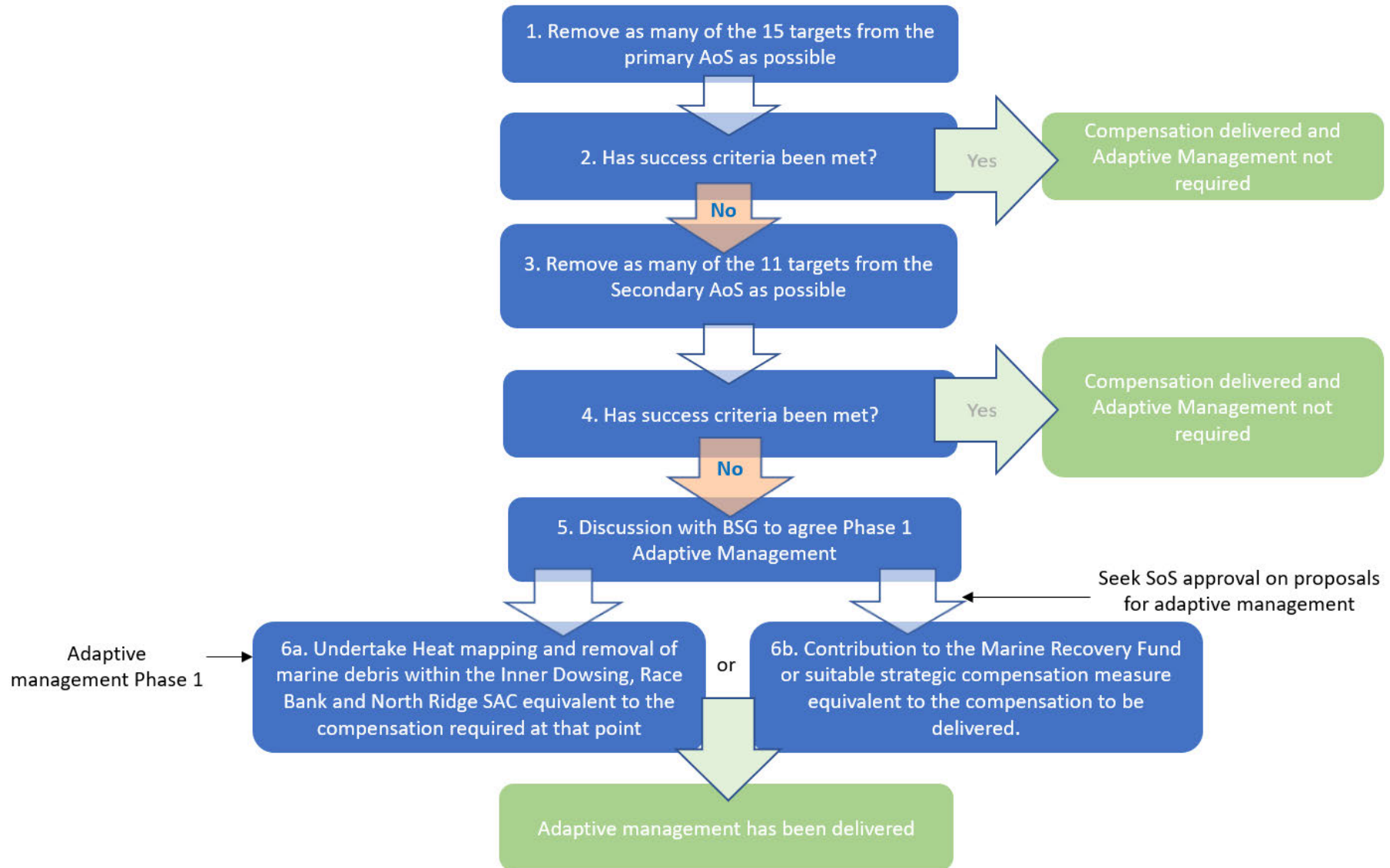


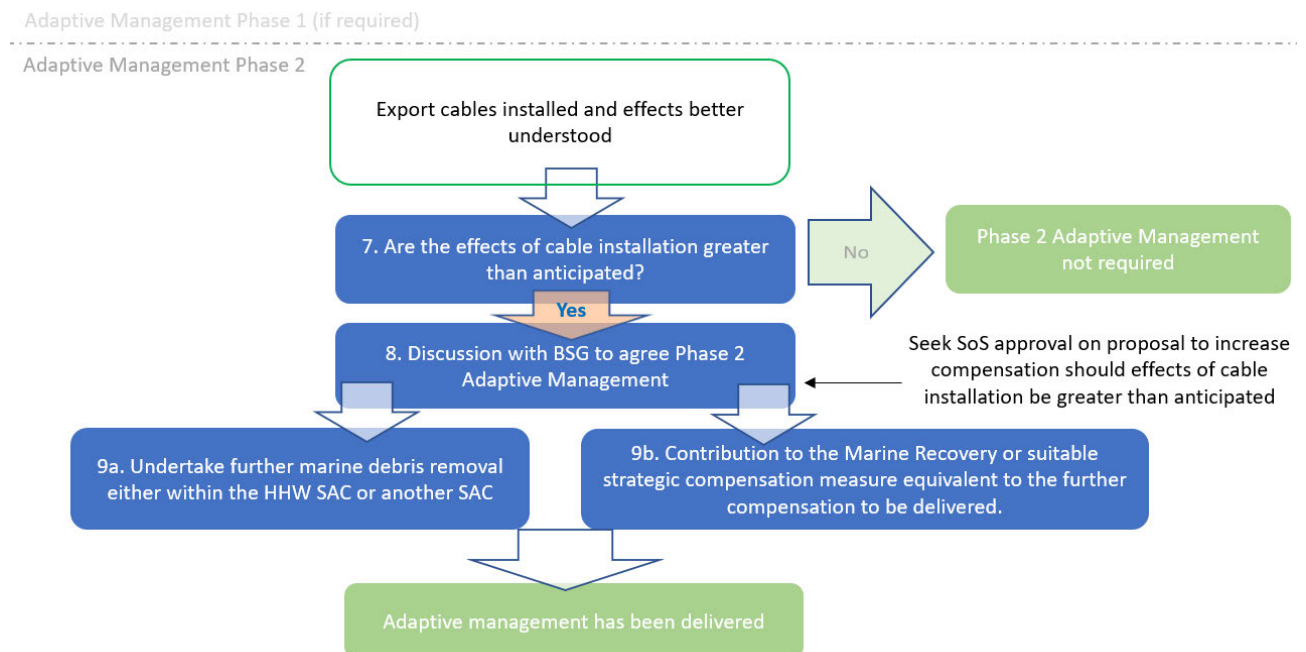
Figure 4 Process for Adaptive Management implementation

3.8.2.2 Following export cable installation

89. The Norfolk Projects Benthic Compensation Schedules state that the BIMP should provide:

*“details of further marine debris removal work that might be carried out if the actual effects of cable installation and protection on the HHW SAC are greater than anticipated”*

90. Once the first export cable has been installed, which is programmed to be June 2026 it will be possible to determine whether effects of cable installation were greater than anticipated. If this is the case then further compensation would be required. This would take the form of further Marine Debris removal should compensation have been delivered through removal from the Primary AoS and further debris is likely to be present within the HHW SAC or should the Phase 1 Adaptive management option 6a (see Figure 4) have been implemented and proved successful with further debris likely to be present within the IDR&NR SAC, further debris removal would be attempted (this is referred to as alternative 9a in Figure 4). However, if both of these had proven unsuccessful further payment into the MRF or suitable strategic compensation measure would be made (this is referred to as alternative 9b in Figure 4). This final phase is termed Adaptive Management Phase 2 and the process is illustrated in Figure 5.



**Figure 5 Process for Adaptive Management implementation should the effects of cable installation on the HHW SAC be greater than expected**

### 3.9 Monitoring

91. This section describes the monitoring requirements for strand 1:
- Marine Debris removal which comprises removal from the Primary AoS and (if required) also the Secondary AoS; and
  - Monitoring for Adaptive Management (which may or may not be triggered).

#### 3.9.1 Marine Debris

92. The Norfolk Projects will conduct monitoring of Marine Debris removal throughout the Marine Debris removal campaign. The monitoring is required to meet two aims:
- 1) to log and record the outcomes of the Marine Debris removal campaign (to establish whether the success criteria have been met); and
  - 2) to ensure that the removal campaign is undertaken in a manner which avoids impacts to sensitive features such as those of archaeological interest and the designated features for the HHW SAC (Annex I Sabellaria reef and Sandbanks) and allows seabed recovery.
93. Given the nature of likely Marine Debris to be removed and the SAC features, improvement in condition of the HHW SAC as whole would be very difficult to determine or measure at a project level. This is due to the fact that once the debris has been removed, the impact has been removed, and the area can recolonise naturally when subjected to natural processes. It is worth noting that seabed monitoring analysis from the Dogger Bank in 2014 (Eggleton et al 2016) suggests that data from both grab and imagery sampling within the sandbank habitats may not be able to detect any statistically robust quantifiable changes in communities. This is partly due to constraints on sampling methods, number of samples and the often-low numbers and abundances of organisms present in the mobile sandy and coarse sediment habitats. It is therefore unlikely that any qualitative assessment monitoring of recovery would be possible. In addition, given the likely scale of objects to be recovered, relocating the exact locations from which debris was recovered will be impractical.
94. The Norfolk Projects therefore do not consider that ongoing monitoring following completion of the debris removal campaign is required to provide any further evidence of habitat restoration following removal of the debris, and post-removal monitoring is not a requirement of the DCOs. However, it is recognised that such monitoring could assist in providing evidence regarding recoverability and therefore, the monitoring detailed below will be conducted.
95. In all instances where debris is removed, an immediate post-removal survey will be completed. This will include ROV sonar (to identify the size of impressions in the

seabed) and ROV image collection (to demonstrate resulting habitat). This may be completed using the ROV at time of removal or by undertaking a second dive with the ROV to ensure sufficiently clear images are captured post-removal where visibility allows. This post-removal seabed survey (conducted immediately at each location where Marine Debris is removed) will constitute the baseline for subsequent monitoring campaigns.

96. Subsequent monitoring will be undertaken on a minimum of five areas (if seabed impression can be accurately located using surface-logged GPS coordinates) where larger items (greater than 10m in diameter) are recovered (as compared against the baseline collected immediately post-removal). If items of that size are not removed, then the next largest items will be selected as the five monitoring locations. Priority will be given to locations where larger objects have been removed to increase the likelihood of identifying remaining seabed impressions one year following Marine Debris removal.
97. Should geogenic reef be identified during the Marine Debris removal campaign (considered unlikely as not identified as a qualifying feature for the HHW SAC), and an item of debris be removed from this habitat type, then this location will be included as a monitoring location in addition to a minimum of five targeted monitoring locations which will be selected in relation to the largest items of debris removed.
98. Monitoring of these five locations will be undertaken using Drop Down Video (DDV) one year post removal (which is considered proportionate to the scale of the removal activity and anticipated recovery duration) to assess any remaining impressions on the sediment and colonisation of epifaunal species. In parallel, a geophysical survey will be undertaken to collect data across the extent of the AoS (which had been subject to debris removal) to provide further consideration of wider changes to the sandbank features.
99. Observations of the homogeneity of the habitat in the area, and the surrounding area, would also inform the likelihood of infaunal recovery. There is considerable evidence, collated by the aggregates industry and others (including Race Bank windfarm), to show that these type of habitats (sedimentary habitats, particularly in areas with mobile substrate) recover quickly (within 1-4 years based upon evidence from dredging and spoil disposal activities, and array cable monitoring at Race Bank (Norfolk Boreas Limited, 2021b) following any disturbance events as long as similar habitat remains (i.e., the event has not resulted in a habitat change). The habitat in the areas where debris is removed are expected to be similar to the surrounding habitat once the item of debris has been removed, and therefore recovery is likely to occur rapidly with mobile opportunistic species recolonising the area almost



immediately after debris removal. It is therefore considered that monitoring of the habitat characteristics will provide an appropriate proxy for infaunal analysis.

100. During the monitoring survey it will also be reported if any new items of Marine Debris have been discovered allowing a better understanding of whether debris accumulates in the removal areas again, and if so, over what timeframes.
101. Should recovery of the feature not be demonstrated at the five targeted monitoring locations; a Year 2 survey (two years post removal) will be conducted at those specific locations to further monitor recovery of the feature. If a seabed impression cannot be identified at a location, recovery will be assumed.
102. Reporting will consider recovery by comparing the baseline data collected in relation to the subsequent monitoring data collected and would be provided to the BSG members. Where requested by the BSG members, supporting metadata will be provided. Following completion of the post-removal monitoring, and subsequent reporting, a final monitoring report will be provided to the SoS to evidence the extent of recovery of the feature in those monitoring locations.
103. Therefore, monitoring for the compensation will comprise:
  - Reporting of details related to all debris recovered (i.e., nature, size, location);
  - Reporting of details of any object unable to be recovered;
  - Analysis of the success of the methodology in terms of the proposed AoS and correctly identifying locations of debris, as well as the area of debris removed;
  - Proposals for any refinements of the methodology; and
  - Details of the selected monitoring locations and comparison of the baseline data collected in relation to the subsequent monitoring data.
104. Reporting of the ongoing activities will be discussed with the BSG and will reflect the period for which the monitoring campaign continues.
105. In accordance with paragraph 32 or the Benthic Compensation Schedules results from the monitoring will be submitted annually to the Secretary of State (see Figure 3) as well as the MMO and Natural England (through the BSG). The reporting will include details of any finding that the measures have been ineffective in securing an improvement in the condition of the HHW SAC and, in such case, proposals to address this through adaptive management (see section 3.8.2.1).

### **3.9.2 Monitoring of adaptive management**

106. Should adaptive management consist of the identification and removal of Marine Debris within the Inner Dowsing, Race Bank and North Ridge SAC, monitoring would take the form of that described above in section 3.9.1. Should adaptive management take the form of a contribution into the Marine Recovery Fund or suitable strategic

compensation measure, the value of the contribution would include a proportionate allowance for monitoring relative to The Norfolk Projects' contribution to the fund.

## 4 STRAND 2: EDUCATION, AWARENESS AND FACILITIES TO LIMIT FURTHER MARINE DEBRIS

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107. In addition to the Marine Debris removal campaign, a second strand of compensation (initially put forward to the SoS as Strand 3 in the HHW SAC compensation plan, but now referred to as Strand 2 within this document) will be undertaken in the form of a campaign focussing on “*education, awareness and facilities to limit further Marine Debris*”. The aim of this is to reduce future Marine Debris entering the HHW SAC and provide a longer-term compensation measure. The requirement for this, as stipulated in the Benthic Compensation Schedules is explained in section 2.2.
108. The education, awareness and provision of facilities campaign will focus on engagement with the East Anglian fishing and conservation organisations to identify opportunities where the Norfolk Projects can facilitate the reduction of Marine Debris by managing the problem at the source.
109. This campaign has been prepared and refined in consultation with the BSG as required under the DCOs. The works outlined in this section have been timetabled to be delivered in accordance with the programme of works presented in Figure 3 and are further detailed in Annex 4.

### 4.1 Method statement

110. In order to discharge the requirement, the Norfolk Projects has been collaborating with the East of England Plastics Coalition (EEPC) Marine Debris Working Group since August 2022 to develop the plan set out below (the full proposal as well as EEPC and Eastern IFCA approval letters are provided in Annex 4).
111. The EEPC was created in January 2019 due to Anglian Water’s vision of removing all plastics from the natural environment. The EEPC comprises 25 members who represent local authorities, NGOs and private businesses who are split into three groups targeting litter reduction, unflushables and Marine Debris.
112. The Norfolk Projects recognised significant synergies between what is needed to discharge this second strand and the vision that the EEPC are working towards. As a result, a proposal for collaboration was put forward and EEPC accepted.
113. Together The Norfolk Projects, the EEPC and the Eastern IFCA are now working to organise a scaled-up version of a Marine Debris pilot project (Economia 2022) that successfully fulfilled its aim to create a short-term scheme to inform a more permanent solution in Norfolk. The Norfolk Projects have provided a detailed proposal to the EEPC and the Eastern IFCA which has been provisionally approved by all parties (Annex 4) with the recognition that final details will be agreed once the

BIMP receives approval from the SoS. The Norfolk Projects have also agreed to part fund the secretariate role for the EEPC Marine Debris Working Group.

114. Building on the Marine Debris pilot project (Eunomia 2022), The Norfolk Projects will deliver on three core collaboration areas which form the pillars of this strand 2 campaign.

#### 4.1.1 Collaboration Area 1: Harbour Bins

115. This first collaboration area targets reducing Marine Debris through harbour operations and potentially local beach cleans. The Norfolk Projects, with EEPC will facilitate the placement of Odyssey Innovation Marine Debris bins at different coastal locations<sup>5</sup> in Norfolk and Suffolk, providing means for accessible disposal in harbours and other locations. Odyssey Innovation is a company that recycle plastic waste, typically retrieved from the oceans to produce new items such as kayaks. Further information can be found on their website<sup>6</sup>.

116. As stated on page 67 of the benthic compensation plan, The Norfolk Projects proposed the following:

*“The provision .... of safe fishing gear disposal bins at local fishing ports and on vessels: although not common, fishing gear can be illegally disposed of at sea if it has become damaged. Once placed in the disposal bins the Applicant would then arrange for safe disposal or recycling of the gear. Bins could also be provided for fishermen to dispose of general waste which otherwise may enter the marine environment.”*

117. The EEPC has well established links with Odyssey Innovation who provide end of life recycling services with an offering of bins specifically for abandoned, lost or otherwise discarded fishing gear (ALDFG). During the Marine Debris pilot project (Eunomia 2022) the EEPC gained insight into effective placement of the bins and integration amidst local harbour networks.

118. Running such a scheme is logistically challenging, particularly organising the efficient emptying of these harbour bins, integrating with existing Marine Debris schemes such as fishing for litter, and the adherence to the specific requirements of Marine Debris that can be recycled by Odyssey Innovation. The Norfolk Projects have confirmed its commitment to this enterprise by part funding a secretariat for the Marine Debris Working Group who will facilitate the running of the scheme (See Annex 4 for further detail).

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<sup>5</sup> The Norfolk Projects is also collaborating with other projects such as Ørsted’s Hornsea Project Three, to ensure that there is a coordinated approach to harbour bin distribution, which does not lead to confusion within the fishing community. Therefore, it is not possible at this stage to provide a definitive number of bin locations.

<sup>6</sup> [REDACTED]

119. The EEPC has highlighted the need for these bins to be managed and locked to avoid general waste items entering into the bins and corrupting the Marine Debris category making it difficult for Odyssey Innovation to recycle. A manager (who the EEPC term “bin guardians”) of the harbour bins would be necessary to avoid their misuse. The EPPC are able to organise such arrangements, monitor and coordinate the bin placement.
120. Specific harbour locations are yet to be decided, however, The Norfolk Projects have proposed the placement of Odyssey Innovation bins at two harbour locations; Southwold and Lowestoft, and that further work will be undertaken in collaboration with the EEPC to identify up to four further locations for bin placement.
121. The Norfolk Projects would provide funding for the transportation of the Odyssey Innovation bins to and from the end-of-life recycling site in Exeter and remuneration costs to cover the bin guardians at the harbour. In the first instance, it is thought to run monthly bin collections across all sites, however this is subject to refinement as the campaign preparation evolves.

#### 4.1.2 Collaboration Area 2: Redundant Fishing Gear

122. This second collaboration area targets damaged or unused fishing gear that lies dormant in yards which may otherwise enter the marine environment. The Norfolk Projects and EEPC will provide depositories in association with fishing gear amnesty events at strategic location along the Norfolk and Suffolk coasts.
123. The Norfolk Projects and EEPC are aware that fishermen struggle to dispose of out of service fishing gear due to the expensive commercial waste category it falls into. Therefore, The Norfolk Projects will assist the EEPC and the Eastern IFCA in the creation of a free to use method for fishery related waste of which disposal fees are covered by The Norfolk Projects.
124. This will provide a measurable way to demonstrate how this second strand of benthic compensation is succeeding with its aims.

#### 4.1.3 Collaboration Area 3: Engagement with Fishermen

125. This third collaboration area focuses on Norfolk fisheries (especially those who fish in the HHW SAC).
126. As stated on page 67 of the benthic compensation plan, The Norfolk Projects proposed an option to:

*“provide, better methods for static gear retrieval such as beacons and tracking systems to ensure that static gear can be swiftly retrieved or relocated if it has moved and undertake data sharing with the fishing industry of the locations of Annex I*

*habitats within the HHW SAC, for example through the provision of memory sticks with relevant shapefiles installed.”*

127. Utilising the EEPC’s strong independent network (as well as that of the Eastern IFCA) amongst the East Anglian fishing community, The Norfolk Projects will undertake a series targeted engagement events to develop some of these concepts. In response the EEPC have since developed a concept called “Chat n’ Chips”. This concept involves informal discussions with fishermen held locally to gather support for the collaboration areas 1 and 2 of this campaign. Incentives will be provided with a free meal, and provision for fuel costs.
128. These “Chat n’ Chips” events will be replicated in locations around East Anglia, for fishermen working in the surrounding areas. To ensure the informal nature of these events, numbers will be limited to eight fishermen per locality, with two Project Facilitators attending each event.
129. The campaign would be sensitively introduced, to set-the-scene and provide some context for collaboration areas 1 and 2. The following topics will be discussed:
  - Current experiences with Marine Debris;
  - Approximation of quantities (maximum potential and likely) for port in question;
  - The details of collaboration areas 1 and 2 e.g., bin with bags details, location, collections business model – service provider (regular) or semi-regular;
  - How they can work with The Norfolk Projects to develop further ideas for Marine Debris prevention; and
  - What potential barriers/challenges they foresee
130. The EEPC have informed The Norfolk Projects that these initial conversations are critical to the success of Marine Debris mitigation campaigns, and it will be during these meetings or following on from them that collaboration area 3 will be developed further into measurable outcomes.

#### **4.1.4 Creation of Code of Best Practice for the HHW SAC**

131. As stated previously the *BIMP must accord with the relevant principles contained in the HHW SAC compensation plan... and must include provision for:*

*(b) education, awareness and facilities to limit further marine debris,*
132. The HHW SAC compensation plan identifies that The Norfolk Projects should identify possible ways that the Norfolk Projects could assist the fishing industry in minimising its impacts on the marine environment.

133. Therefore, the final aspect of the education, awareness and provision of facilities campaign involves the creation of a Code of Best Practice for fishing within the HHW SAC. The Norfolk Projects will work with the EEPC and the BSG on the production of a code which will be similar to that which is being developed to reduce the impact of lost gear for potting fisheries in an existing Marine Conservation Zone (MCZ) (Eastern IFCA 2022). Once a draft code has been established a consultation process with the appropriate fishermen will be undertaken with the aim of agreeing and finalising the code and for fishermen to agree to follow it. The EEPC and the BSG will support the implementation of this consultation process through their well-developed network within the Norfolk fishing community (see Annex 4).

## 4.2 Monitoring

134. The Norfolk Projects will monitor the progress of strand 2 by requiring the EEPC to produce annual progress updates, reporting on the following:

- Size and volume of material recovered;
- An approximation of how much of the above could be attributed to the support provided by The Norfolk Projects;
- A breakdown of the various pathways the material took following its collection; and
- What products the recycled material has been used for.

135. See Annex 4 for further details on the monitoring agreements between The Norfolk Projects and the EEPC for strand 2.

## 5 AVOIDING IMPACTS TO THE HHW SAC

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### 5.1 Cable specification, installation and monitoring plan

136. Separate to the Benthic Compensation schedules, Condition 9 (1) (g) of the Norfolk Boreas Transmission Licences (Schedules 11 and 12) secures the provision of:

*“a cable specification, installation and monitoring plan [CSIMP] for the installation and protection of cables within the Haisborough, Hammond and Winterton Special Area of Conservation which accords with the principles set out in the outline Norfolk Boreas Haisborough, Hammond and Winterton Special Area of Conservation Cable Specification, Installation and Monitoring Plan such plan to be submitted to the MMO (in consultation with the relevant statutory nature conservation body).”*

137. This plan will be developed for The Norfolk Projects and will describe in detail how impacts to the HHW SAC will be avoided as far as possible. This document will be required to be produced between 12 and 6 months prior to export cable installation as there is also a requirement for results of the preconstruction survey for Annex I Sabellaria reef to inform it. The pre-construction survey must take place no more than 12 months prior to cable installation and therefore it will be produced long after submission of this BIMP for approval.
138. The CSIMP will focus on how impacts caused by export cable installation will be minimised through the mitigation measures secured within the Outline CSIMP (Norfolk Boreas Limited, 2020) and will be completely independent of the BIMP for the reasons identified above. The monitoring which will be secured within the CSIMP will focus on a robust monitoring campaign designed to answer the following questions:
- What is the rate of recovery (if any is encountered) of Annex I Sabellaria reef following cable installation?
  - If Annex I Sabellaria reef is encountered, what is the overall area of impact?
  - What is the rate of recovery of other sandbank related habitat following cable installation; and
  - What communities colonise cable protection (if any is placed within the HHW SAC).
139. The Norfolk Projects is aware of the Offshore Wind Environment Evidence Register (OWEER). OWEER includes expert prioritisation of various research projects undertaken in relation to effects of cable protection and research gaps. Therefore, The Norfolk Projects will incorporate the knowledge around evidence gaps and ongoing research when setting the aims and objectives for the monitoring secured



within the CSIMP and may modify the research questions suggested above accordingly.

140. Notwithstanding the above, the Marine Debris removal process will avoid impacts to the features of the HHW SAC as described in the remainder of this section.

## 5.2 Protected reef habitats within designated sites

141. The Benthic Compensation Schedules state that the BIMP should provide “*details of how all impacts to protected reef habitats within the HHW SAC will be avoided where possible*”.
142. Section 3.3 and Annex 3 explain how all known areas of Annex I Sabellaria reef were used to inform the heat mapping exercise. A 50m buffer was applied around the Annex 1 reef locations and these were treated as hard constraints within which no Marine Debris removal would occur.
143. Section 3.6.1 explains how impacts to as yet unknown Annex 1 Sabellaria reef would be avoided through the decision tree process, whereby during the removal process the Benthic Ecologist will be viewing the live feed from the retrieval ROV and if Sabellaria reef has established on an item of Marine Debris it will not be removed from the seabed.

## 5.3 Management of dredging and disposing of material

62. The Benthic Compensation Schedules state that the BIMP must provide:
- “(i) details of the locations for the disposal of dredged material, and evidence that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features, particularly reef habitats.”*
144. As presented in section 3.6, the proposed methodology for removal of Marine Debris does not include dredging of the seabed therefore there will be no disposal of dredged material.

## 6 CONCLUSION

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145. This Benthic Implementation and Monitoring Plan has been prepared pursuant to paragraph 29 of Schedule 19, Part 3 of the Norfolk Boreas Offshore Wind Farm Order 2021 (Norfolk Boreas DCO) and paragraph 29 of Schedule 17, Part 3 of the Norfolk Vanguard Offshore Wind Farm Order 2022 (Norfolk Vanguard DCO) (together referred to as the Benthic Compensation Schedules) and this document serves to discharge the condition which requires submission of the Benthic Implementation and Management Plan for both projects.
146. The document seeks to address sub paragraphs a) to i) within paragraph 29 of the Benthic Compensation Schedules. Meeting the success criteria which has been determined by targets set out in the DCOs will be challenging and although significant steps have already been taken to attempt to meet these targets it is recognised that this may not be possible and therefore specific attention has been given within this document to what form adaptive management would take.
147. This document illustrates that significant progress has already been made on both the retrieval of Marine Debris and the delivery of education, raising of awareness and provision of facilities to limit further Marine Debris. This demonstrates The Norfolk Projects ongoing commitment to deliver effective and meaningful benthic compensation.

## 7 REFERENCES

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Eastern Inshore Fisheries and Conservation Authority (EIFCA) (2022) Press Release: Code Of Best Practice Launched To Tackle Lost Gear In Cromer Shoal Chalk Beds MCZ. Available at: <https://www.eastern-ifca.gov.uk/press-release-code-of-best-practice-launched-to-tackle-lost-gear-in-cromer-shoal-chalk-beds-mcz/>

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Gilman, E., Musyl, M., Suuronen, P. et al. Highest risk abandoned, lost and discarded fishing gear. Sci Rep 11, 7195 (2021). [REDACTED]

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Available at: [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002468-8.20%20Outline%20Norfolk%20Boreas%20Haisborough%20Hammond%20and%20Winterton%20Special%20Area%20of%20Conservation%20Cable%20Specification,%20Installation%20and%20Monitoring%20Plan%20\(Versions%202\)%20\(Clean\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002468-8.20%20Outline%20Norfolk%20Boreas%20Haisborough%20Hammond%20and%20Winterton%20Special%20Area%20of%20Conservation%20Cable%20Specification,%20Installation%20and%20Monitoring%20Plan%20(Versions%202)%20(Clean).pdf)

Norfolk Boreas (2021a) HHW SAC compensation plan (originally titled In Principle Habitats Regulations Derogation, Provision of Evidence Appendix 3 Haisborough, Hammond and Winterton SAC In Principle Compensation): Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002829-8.25%20In%20Principle%20Habitats%20Regulations%20Derogation,%20Provision%20of%20Evidence%20Appendix%203%20Haisborough,%20Hammond%20and%20Winterton%20SAC%20In%20Principle%20Compensation.pdf>

Norfolk Boreas Limited (2021b) The Applicant's Response to the Request for Additional Information.

Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002841->

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Ørsted (2021). Hornsea Three Sandbank Implementation Plan: North Norfolk Sandbanks and Saturn Reefs SAC. Available at:  
[https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-003626-Hornsea%20Three%20Sandbank%20Implementation%20Plan%20NNSR%20\(07122823\\_A\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-003626-Hornsea%20Three%20Sandbank%20Implementation%20Plan%20NNSR%20(07122823_A).pdf)

**ANNEX 1: DCO BENTHIC COMPENSATION SCHEDULES WORDING**

Norfolk Boreas	Norfolk Vanguard
The BIMP must include in particular:	
(a) details of any further survey work required to confirm the presence and condition of marine debris;	a) details of any further survey work required to confirm the presence and condition of marine debris;
(b) details of the location, nature and size of material to be removed from the HHW SAC, which should equate to no less than 8.3 hectares to compensate for the predicted effects of cable installation and protection;	(b) details of the location, nature and size of material to be removed from the HHW SAC, which should equate to no less than the area required to compensate for the predicted effects of cable installation and protection (up to 8.3 hectares) but taking into account the quantum of marine debris removal that might already have been delivered pursuant to Part 3 of Schedule 19 of the Norfolk Boreas Development Consent Order by way of compensation for disturbance to reef habitats where the impact on the HHW SAC is shared by virtue of the shared cable corridor;
(c) a method statement for its removal, to include the vessel type, tools used and mitigation for how impacts on the surrounding habitat will be minimised;	(c) a method statement for its removal, to include the vessel type, tools used and mitigation for how impacts on the surrounding habitat will be minimised;
(d) a programme of works for removal which must ensure that 8.3 hectares of marine debris has been removed prior to commencement of any cable installation works in the HHW SAC;	(d) a programme of works for removal which must ensure that the required area of marine debris has been removed prior to commencement of any cable installation works in the HHW SAC;
(e) proposals for monitoring in accordance with the principles set out in the HHW SAC compensation plan as well as proposals for reporting of monitoring;	(e) proposals for monitoring in accordance with the principles set out in the HHW SAC compensation plan as well as proposals for reporting of monitoring;
(f) success criteria, adaptive management measures, details of alternative search areas outside the HHW SAC to remove the required quantum of marine debris if 8.3 hectares cannot be recovered from the HHW SAC itself and details of further marine debris removal work that might be carried out if the actual effects of cable	(f) success criteria, adaptive management measures, details of alternative search areas outside the HHW SAC to remove the required quantum of marine debris if the required area cannot be recovered from the HHW SAC itself and details of further marine debris removal work that might be carried out if the actual effects of cable

Norfolk Boreas	Norfolk Vanguard
installation and protection on the HHW SAC are greater than anticipated;	installation and protection on the HHW SAC are greater than anticipated;
(g) programme of delivery for education, awareness and provision of facilities to reduce further marine debris from affecting the HHW SAC;	(g) programme of delivery for education, awareness and provision of facilities to reduce further marine debris from affecting the HHW SAC;
(h) details of how all impacts to protected reef habitats within the HHW SAC will be avoided where possible*; and	(h) details of how all impacts to protected reef habitats within the HHW SAC will be avoided where possible and details of any other mitigations that were included in the outline Norfolk Vanguard Haisborough, Hammond and Winterton Special Area of Conservation site integrity plan; and
(i) details of the locations for the disposal of dredged material, and evidence that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features, particularly reef habitats.	(i) details of the locations for the disposal of dredged material, and evidence that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features, particularly reef habitats.

\* Amended in the Norfolk Boreas Corrections ORDER 2022 (S.I 2022 No. 901)

## **ANNEX 2: THE NORFOLK PROJECTS BENTHIC COMPENSATION CONSULTATION REPORT (SUBMITTED AS A SEPARATE DOCUMENT)**

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**ANNEX 3: MARINE DEBRIS IDENTIFICATION HEAT MAPPING REPORT (SUBMITTED AS  
A SEPARATE DOCUMENT)**

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**ANNEX 4: FURTHER INFORMATION TO SUPPORT STRAND 2 (SUBMITTED AS A SEPARATE DOCUMENT)**

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