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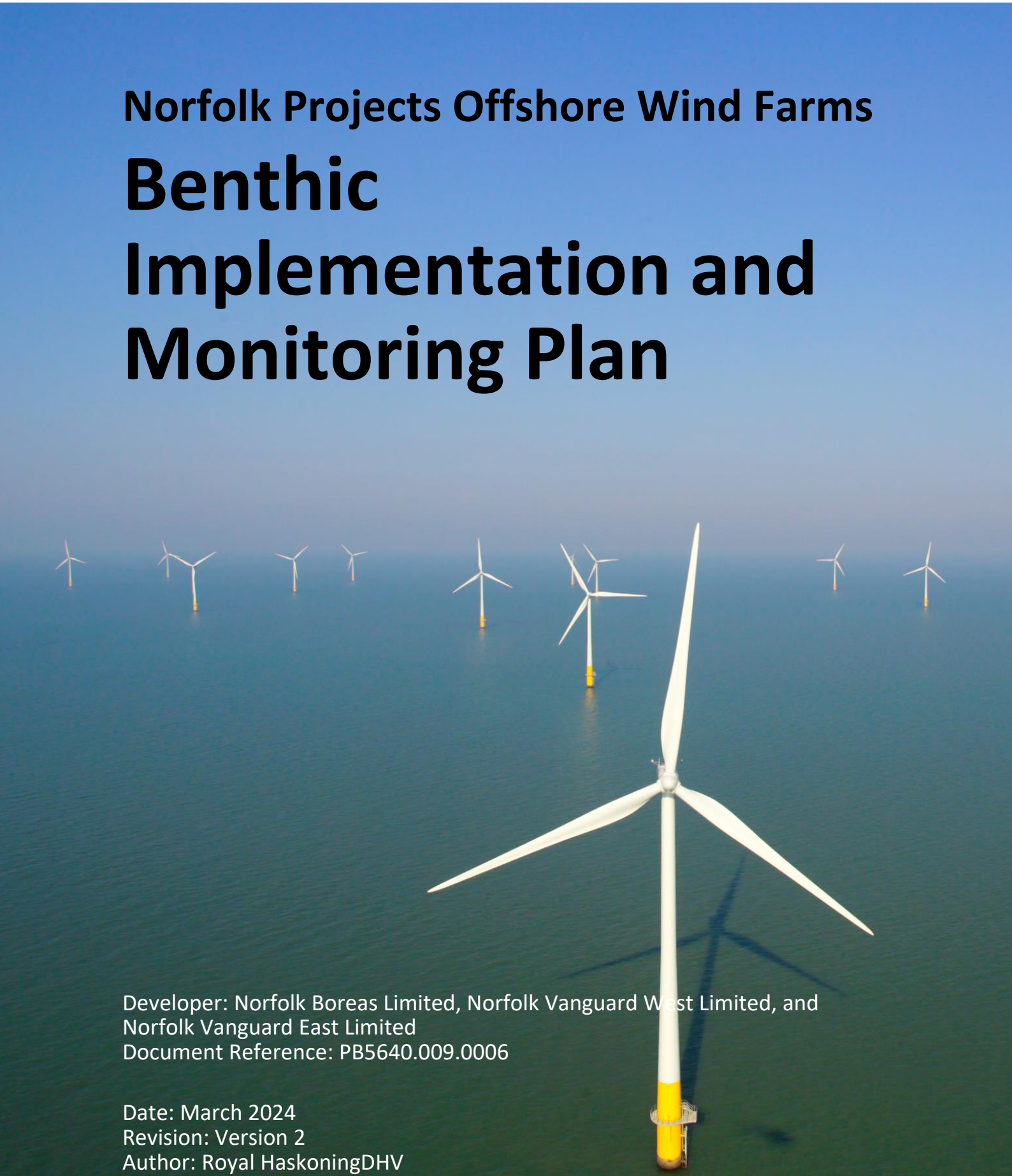
Norfolk Projects Offshore Wind Farms

Benthic Implementation and Monitoring Plan



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Date	Issue No.	Remarks / Reason for Issue	Author	Checked	Approved
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16/11/2022	01D	First full draft for BSG Review	SF/LB/DT	LB/DT	JL
21/12/2022	02D	Second draft to address BSG comments	SF/LB/DT	LB/DT	JL
30/01/2023	03D	Third draft to address further BSG comments and update following discussions with Defra	SF/LB/DT	LB/VR	JL
03/03/2023	04D	Fourth Draft for Final BSG review and sign off	DT	LB/VR	JL
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05/02/2024	05D	Draft for internal Vattenfall and Legal review	DT/SF/RL	VR	YB
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EXECUTIVE SUMMARY

Norfolk Vanguard and Norfolk Boreas offshore wind farms (collectively known as The Norfolk Projects) were both granted development consent with the requirement to deliver benthic compensation. As stipulated within the Development Consent Orders (DCOs), the Applicant (Norfolk Boreas Limited, Norfolk Vanguard West Limited and Norfolk Vanguard East Limited), has formed a Benthic Steering Group (BSG) consisting of several key stakeholders in order to guide the delivery of the benthic compensation. The group has been working together since early 2022, with the Plan of Works under which the steering group operates approved by the Secretary for State for Business, Energy and Industrial Strategy[1] in September of that year.

The Norfolk Projects benthic compensation requirements stipulate that, for either Norfolk Boreas alone or Norfolk Vanguard alone, an area of 8.3 hectares of marine debris should be removed from the Haisborough, Hammond and Winterton (HHW) Special Area of Conservation (SAC). This is required in order to compensate for an equivalent area of seabed impacted by each project. Due to the fact that the Habitats Regulations Assessment concludes that 5.9 of the 8.3 hectares would occur as a result of in-combination effects of The Norfolk Projects together, the combined total of debris to be removed under both DCOs is 10.7 hectares (2.4 hectares for Norfolk Boreas + 2.4 hectares for Norfolk Vanguard (East and West) + 5.9 hectares in-combination = 10.7 hectares). The requirements go on to state that if it is not possible to remove the required quantity of debris from the HHW SAC, other locations should be identified from which this quantum of marine debris (or shortfall) should be removed.

Analysis of exiting data from the 108.6km^2 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 0.06 debris items per km^2). In order to improve upon this, The Norfolk Projects has undertaken an exercise to predict and map (also known as heat mapping) 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 were surveyed in 2022 to identify what debris is present within them. It has been found that these areas contain debris at densities of up to 5.3 items per km^2. Debris removal will be attempted during 2024 at both areas surveyed. A Marine Licence application, which has been developed in consultation with the BSG, has been submitted to the MMO (a member of the BSG), in order to grant The Norfolk Projects permission to undertake this marine debris removal. Any possible impacts of the campaign will be mitigated and reduced to an acceptable level through the use of non-invasive techniques and avoidance of sensitive features, such that the campaign will not cause an

[1] As of the 7th February 2023 the Business Energy and Industrial Strategy became the Department for Energy Security and Net Zero

adverse effect on the integrity of the SAC. The standard determination period for marine licence applications is 13 weeks and therefore award of this licence is expected in mid-May.

Due to the fact that the initial surveys found only very low quantities of debris within the HHW SAC, further surveys, again guided by heat mapping predicting where debris would accumulate, within the HHW SAC and within the Inner Dowsing, Race Bank and North Ridge SAC (designated for the same features as the HHW SAC) were undertaken in late 2023. These surveys resulted in similar low densities of marine debris being identified. The experience from other offshore wind farm projects which have undertaken debris removal in other SACs (again designated for similar features) has also been that debris is not available in the quantities that would be needed to meet The Norfolk Projects 10.7 hectares requirement. For both of these reasons, The Norfolk Projects do not propose to undertake any further marine debris surveys. This approach has been agreed by the Benthic Steering Group.

The analysis of existing data (which is provided within this version of the Benthic Implementation and Monitoring Plan (BIMP)), evidence from other projects where seabed debris removal has been undertaken, and advice from academics, demonstrates that removing 8.3 hectares (or 10.7 hectares across both projects) of material from the seabed within SACs designated for seabed features would be extremely challenging as marine debris is unlikely to be present on the seabed at sufficient densities. Therefore, although best efforts will be made through targeting the aforementioned areas within the HHW SAC to remove the quantum required, it is considered highly unlikely that success will be met through this campaign alone. Consequently, and in accordance with a letter from the Secretary of State[2] advising that "*There is wide scope to identify other locations for such recovery"*, The Norfolk Projects has expanded its search for marine debris and now proposes a far more extensive suite of measures to provide confidence that at least 10.7 hectares of marine debris will be retrieved.

Given the challenges outlined above, The Norfolk Projects has searched for solutions likely to result in the greatest quantity of material removed. The search covered currently available options both in the North Sea, UK and also globally, drawing on the experience of organisations who have been working in this area for a number of years. This search has revealed that sea surface removal of mainly plastics, by a company called The Ocean Cleanup, is likely to yield by far the largest quantity of marine debris. Between 2021 and the middle of 2023, The Ocean Cleanup removed 350,000kg of ocean plastic over a period of 2.5 years. However, The Ocean Cleanup has advised The Norfolk Projects that the amount of debris available in the North Sea is not sufficient to warrant an Ocean Cleanup campaign in

[2] The Secretary for State for Department of Energy Security and Net Zero letter of the 30 October 2023 providing advice on version 1 of The Norfolk Projects Benthic Implementation and Monitoring Plan Version 1 https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-003031-Norfolk%20Projects%20-%20BIMP%20response%20-%2031%20Oct%202023_Redacted.pdf

that location. The Benthic Compensation Schedules do not restrict debris removal to be undertaken from the seabed only[2]. Funding The Ocean Cleanup to undertake a campaign to remove nearly 40,000kg of plastic would exceed The Norfolk Projects' benthic compensation 10.7ha removal requirement by achieving removal of approximately 72.9ha (using a conversion factor calculated to be 30.525m^2 per kg for nets and 0.102m^2 per kg for other plastics). Accordingly, there can be confidence that 10.7ha of marine debris will be retrieved. However, The Norfolk Projects has also sought to include marine debris removal from closer to where the impacts of cable installation will occur. Thus, exceeding the 10.7ha requirement further.

With guidance from academics at Plymouth and Newcastle Universities, further proposals have been developed to remove marine plastics from the coastline of southeast England. A collaboration has therefore been formed with two organisations called Norfolk Beach Cleans and Keep Britain Tidy with the aim of removing a further 4,124kg of plastic from the beaches of the UK. This equates to an area of 0.98ha (using a conversion factor calculated to be 2.37m^2 per kg).

To complete the marine debris removal proposals and to provide a direct focus on benthic habitats, debris removal from other locations (to the HHW SAC) within the southern North Sea and English waters are proposed. Through collaborations with Stichting Duik de Noordzee Schoon (English translation: Dive the North Sea Clean foundation) and Ghost Fishing UK, The Norfolk Projects propose that debris removal campaigns are undertaken at numerous locations including, but not limited to; an area known as the Brown Bank (located less than 10km southeast of The Norfolk Projects), the northeast coast of England, and throughout the English Channel. Through these campaigns it is estimated up to 10,800kg of fishing gear (mainly nets) will be retrieved from the seabed. It has been calculated, by using a conversion factor of 15.312m^2 per kg, that an area of 2.8ha of marine debris would be retrieved by Ghost Fishing UK and that, by using a conversion factor of 7.092m^2 per kg[3], 5.74ha of marine debris would be removed by Stichting Duik de Noordzee Schoon.

With the addition of four new work streams (removal campaigns undertaken in collaboration with Ghost Fishing UK and Stichting Duik de Noordzee Schoon, beach cleans in association with Norfolk Beach Cleans and Keep Britain Tidy, and a collaboration with The Ocean Cleanup), there can be complete confidence that at least 10.7ha of marine debris can be removed and, in all likelihood, this figure will be exceeded many times over.

The Norfolk Projects is aware of objectives to deliver strategic compensation through novel mechanisms such as the Marine Recovery Fund (MRF) for which primary legislation has been enacted in the form of the Energy Act 2023. However, as secondary legislation and a library of measures to deliver strategic compensation has yet to be established (noting

[3] These two conversion factors are different due to the different types of net the two organisations remove. Ghost Fishing UK generally remove lighter nets than Duik de Noordzee Schoon

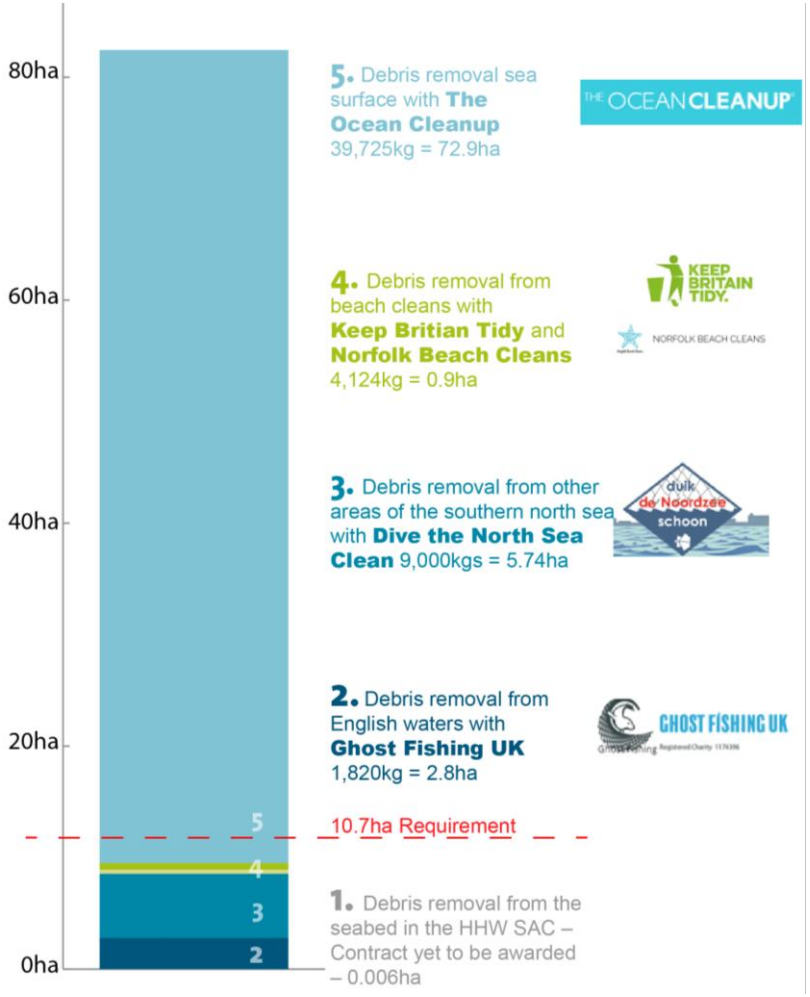
DEFRA has recently approved designation and extension of Marine Protected Areas as a possible measure for benthic compensation), and the fact that the Secretary of State has informed The Norfolk Projects of its uncertainty on the timeframes for the MRF's development, the MRF is not relied on within this version of the BIMP. Should further options for adaptive management become available (such as designation or extension of MPAs) within the time constraints of The Norfolk Projects, these will be considered at that time and discussed with the BSG, with the final form of any adaptive measures required being approved by the Secretary of State.

Furthermore, should the actual effects caused by export cable installation be greater than predicted during the application stage, when the worst-case scenarios for effects were calculated, the adaptive management measures would be increased accordingly (post cable installation). This would either be through an increase in the scale of the removal campaigns (one or more of the work streams, excluding debris removal from the HHW SAC) carried out or, should it be available at that time, could consist of an alternative from of adaptive management which would be discussed with the BSG and approved by the Secretary of State.

A further requirement of the benthic compensation is to deliver education, awareness and facilities to limit further marine debris. In collaboration with the Eastern Inshore Fisheries and Conservation Authority and the East of England Plastic Coalition, who aim to achieve similar objectives, The Norfolk Projects (with support of the BSG), have proposed a coordinated campaign to facilitate the collection and recycling of unwanted fishing gear and meet with local fishermen to investigate further initiatives that could be pursued (for example the provision of waste disposal facilities at fishing ports) to increase the sustainability of fishing activities within the HHW SAC and its surrounding area. This element of benthic compensation has already commenced 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.

The Norfolk Projects firmly believes that by undertaking the work streams detailed within this version of the BIMP, in collaboration with its partners (as shown in the graphic below), it will not only deliver an area of marine debris removal in excess of that required by the DCOs, but will achieve extensive and far-reaching environmental benefits for many years.

Debris Removal



Debris Education & Awareness Campaign

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Annexes to this report

Number	Name	Document Reference
Annex 1	DCO Benthic Compensation Schedules	Included at page 115 of this document
Annex 2	Norfolk Projects 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)
Annex 5	Inclusion of further detail in response to the SOS comments in letter of 30 October 2023	Included at page 120 of this document.
Annex 6	Ghost Fishing UK letter of intent	Included at page 124 of this document.
Annex 7	Dive the North Sea Clean letter of intent.	Included at page 125 of this document.
Annex 8	Norfolk Beach Cleans letter of intent	Included at page 126 of this document.
Annex 9	Keep Britian Tidy letter of intent	Included at page 127 of this document.
Annex 10	The Ocean Cleanup letter of intent	Included at page 128 of this document.
Annex 11	Calculating the area of a net and converting its weight to an area	Included at page 129 of this document.
Annex 12	Paper presenting the case that 10.7ha of debris removal is required.	Included at page 130 of this document.

Glossary of Acronyms

ALDFG	Abandoned, Lost and Discarded Fishing Gear
AoS	Areas of search
BEIS	The Department for Business, Energy and Industrial Strategy
BIMP	Benthic Implementation and Monitoring Plan
BSG	Benthic Steering Group
COWSC	Collaboration in Offshore Wind Strategic Compensation
CSIMP	Cable Specification, Installation and Monitoring Plan
DCO	Development Consent Order
DDNZS	Stichtig Duik de Noordzee Schoon or Diving the North Sea Clean
DDV	Drop Down Video
DESNZ*	The Department for Energy Security and Net Zero
DML	Deemed Marine Licence
EEPC	East of England Plastic Coalition
EIFCA	Eastern Inshore Fisheries and Conservation Authority
FLO	Fisheries Liaison Officer
GPGP	Great Pacific Garbage Patch
ha	Hectare
HHW	Haisborough, Hammond and Winterton
HRA	Habitat Regulations Assessment
HSE	Health, Safety, and Environment
JNCC	Joint Nature Conservation Committee
KBT	Keep Britain Tidy
Kg	Kilogram
KHz	Kilohertz
Km	Kilometre
m^2	Metre squared
MBES	MultiBeam EchoSounder
MCS	Marine Conservation Society
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MRF	Marine Recovery Fund
NBC	Norfolk Beach Cleans
NFFO	National Federation of Fishing Organisations
NPGP	North Pacific Garbage Patch
OWEER	Offshore Wind Environmental Evidence Register
ROV	Remotely Operated Vehicle
SAC	Special Area of Conservation
SNCB	Statutory Nature Conservation Body
SoS	Secretary of State*
SSS	Side-Scan Sonar
SSSI	Sites of Special Scientific Interest
UXO	Unexploded Ordnance
WMP	Waste Management Plan

* Formerly for Business, Energy and Industrial Strategy and from the 7th February 2023 onwards for Energy Security and Net Zero.

1 INTRODUCTION

1. This document sets out the Benthic Implementation and Monitoring Plan (BIMP) for the delivery of benthic compensation in accordance with the Norfolk Boreas Offshore Wind Farm Order 2021 and the Norfolk Vanguard Offshore Wind Farm Order 2022. The BIMP has been developed in consultation with The Norfolk Projects Benthic Steering Group (BSG).

2. Norfolk Boreas, Norfolk Vanguard West and Norfolk Vanguard East are three offshore wind farm projects (referred to as The Norfolk Projects) which are being developed by Vattenfall Wind Power Ltd (Vattenfall) as the parent company of Norfolk Boreas Limited, Norfolk Vanguard East Limited and Norfolk Vanguard West Limited. They are three 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. During the application stage for the projects, the two limited companies which made the applications for the Development Consent Orders comprised Norfolk Boreas Limited and Norfolk Vanguard Limited. Following consent of both projects the decision was made to split them into three separate projects to reflect the three separate array areas. This required the formation of a third company (Norfolk Vanguard East Limited) and the change in name of Norfolk Vanguard Limited to Norfolk Vanguard West Limited.

4. Due to the potential effects of The Norfolk 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 DCOs require the provision of benthic compensation.

5. 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 requirement under both DCOs to submit a BIMP for the Secretary of State's (SoS) approval.

6. The wording of the conditions is very similar in both DCOs 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.

7. 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).

8. In summary, the Benthic Compensation Schedules state that the BIMP must include the following:

   a) *details of any further survey work required to confirm the presence and condition of marine debris;* [Provided in section 3.1.4]*;*

   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;* [Provided in section 3.1.5]*;*

   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 3.1.6]*;*

   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;* [Provided in section 3.2]*;*

   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 3.10]*;*

   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*

   g) *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 sections 3.8, 3.9, 3.3, 3.4, 3.5, 3.6, and 3.9.1.3]*;*

   h) *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 3.2]*;*

   i) *details of how all impacts to protected reef habitats within the HHW SAC will be avoided where possible* [Provided in section 5.2]*; and*

   j) *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].

9. Due to the fact that the Habitats Regulations Assessment concludes that 5.9 of the 8.3 hectares would occur as a result of in-combination effects of The Norfolk Projects together, the combined total of debris to be removed under both DCOs is 10.7 hectares (2.4 hectares for Norfolk Boreas + 2.4 hectares for Norfolk Vanguard (East and West) + 5.9 hectares in-combination = 10.7 hectares) The case made by The Norfolk Projects for this combined total is presented in Annex 12.

1.1 Document development

10. Version 1 of the BIMP was submitted to the SoS in March 2023. This version (Version 2 or V2) of the BIMP has been revised to take account of a letter sent to The Norfolk Projects by The Department for Energy Security and Net Zero (DESNZ) on the 30 October 2023[4]. Annex 5 signposts the reader to the sections within the BIMP that have been added to address the matters raised by DESNZ in that letter. In particular, the BIMP V2 includes further measures to ensure that 10.7ha of marine debris will be removed prior to cable installation. Annex 5 of this document also explains how the BIMP addresses the matters contained in the SoS letter dated 30 October 2023.

11. The BSGs feedback which has informed BIMP Version 2 has been recorded via The Norfolk Projects BSG Agreement log (see below) and further evidence of this feedback and support for the BIMP is presented in Appendix 3 of Annex 2 of this document (The Norfolk Projects Benthic Compensation Consultation report).

1.2 Consultation

12. The BSG is comprised of representatives of The Norfolk Projects, Natural England, the Marine Management Organisation (MMO), The Eastern Inshore Fisheries and Conservation Authority (EIFCA) and The National Federation of Fishing Organisations (NFFO). A chairperson, who is independent from the member organisations, has been appointed to oversee proceedings.

13. 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 into the process and the feedback received has been considered and acted upon where appropriate. An agreement log is being kept by the BSG secretariate and updated prior to and following each meeting. The agreement log at the time of submission of the BIMP V2 is provided as Appendix 2 to the consultation report (Annex 2 of this document). In order to prepare the BIMP, significant consultation has been undertaken with third parties to understand where marine debris is located and how best to remove it. This consultation has also been documented within Annex 2.

[4] Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-003031-Norfolk%20Projects%20-%20BIMP%20response%20-%2031%20Oct%202023_Redacted.pdf

2 SUMMARY OF PROPOSED COMPENSATION MEASURES

14. Derelict abandoned, lost and discarded marine debris has 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).

15. In recent years there has been increasing international recognition of the need for multilateral efforts to address the detrimental effects of marine debris including abandoned, lost and discarded fishing gear (ALDFG) to reduce habitat alteration and degradation (Gilman et al., 2021).

16. For the purpose of the compensation requirement, 'marine debris removal' (as agreed by the BSG) is specified as:

    The removal of persistent anthropogenic material which has not been intentionally discarded to the marine environment, with the exception of recognised wrecks.

17. Examples of marine debris include discarded or lost fishing gear, floating plastics, dropped objects either from vessels or offshore structures, maritime disasters or illegally jettisoned waste.

18. The wording of the DCO does not stipulate that the material should be removed from the seabed but does stipulate that the BIMP should include "*alternative search areas outside the HHW SAC to remove the required quantum of marine debris if [10.7 hectares] cannot be recovered from the HHW SAC itself*". The SoS's letter of 30 October 2023 also stipulated that "*There is wide scope to identify other locations for such recovery, and you* [The Norfolk Projects] *may wish to seek suggestions from stakeholders to help identify alternative locations".*

2.1 Overview of compensation strand 1: The identification and retrieval of marine debris

19. It is highly unlikely that there is sufficient marine debris available within the HHW SAC, to meet the 10.7ha requirement for The Norfolk Projects combined 3.8. Section 3.2 explains this further. In the SoS's letter dated 30 October 2023 DESNZ concluded that further work was needed to provide more confidence that the stipulated amount of debris would be removed from the marine environment. The SoS also highlighted that there is a "*wide scope to identify other locations for such recovery*". It was also highlighted that "*secondary legislation will be required to set up the MRF. At present there is no certainty about the timing for establishing the MRF, or whether its scope will act as a mechanism for strategic compensation of the impacts of these projects"*.

20. In response to the SoS's comments, the BIMP now places a far greater reliance on the certainty of removing 10.7ha of marine debris in advance of cable installation, with reliance on adaptive management measures only in the event that the initial compensation does not deliver the amounts expected, or that cable installation results in greater impacts than predicted. In order to provide confidence that 10.7 hectares of marine debris will be removed, five separate work streams are proposed (four of which are newly presented in this version 2 of the BIMP) as detailed in section 3 below.

21. By targeting marine debris removal over these five separate work streams, there can be confidence that 10.7ha of marine debris will be removed and that, in addition, benefits will be seen at: a local level (to the HHW SAC), a regional level (within the North Sea and English waters) and at a global level. This is in addition to the measures, and considerable benefits, that will be delivered at a regional level by Strand 2 of the Benthic compensation (see section 2.2 below).

22. Marine debris removal from the HHW SAC (Work stream 1) is focused on identifying items of marine debris (as defined in paragraph 16) that are on, or partially buried within the seabed of the HHW SAC and removing them if possible. 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.

23. 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 removal phase.

24. The desk-based study (which can be found in Annex 3) 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. This process of identification of marine debris is summarised in section 3 of this document, and described in full in Annex 3 which includes details of the methodology, justified rationale and a description of the data sources analysed to determine the AoS.

25. Surveys of the AoS were completed in September 2022 and the data has been analysed (see section 3.1.5) to identify suitable targets. Debris will be removed from the seabed and disposed of onshore during a campaign in 2024. The methodology for this process, including disposal onshore, is covered in section 3.1.6. It has been estimated that debris with a footprint of up to 0.006ha will be removed by this work stream.

26. The Norfolk Projects has been working with an organisation called Ghost Fishing UK who remove lost or abandoned fishing gear from UK waters (work stream 2). Ghost Fishing UK previously operated mainly in Scotland and Southwest England but in collaboration with The Norfolk Projects will be able to expand its operations into the North Sea. The Norfolk Projects will provide funding, equivalent to that required for a campaign to be undertaken by Ghost Fishing UK in 2024 which will include 10 separate operations at various locations around the eastern and southern coasts of England. Details of the proposed work are provided in section 3.3. It has been estimated that this campaign will result in 1,820kg, representing an area of 2.76ha, of marine debris being removed.

27. In order to remove debris from the seabed in other parts of the North Sea, The Norfolk Projects will collaborate with Duik de Noordzee Schoon (DDNZS[5]), which translates in English to Dive the North Sea Clean, (work stream 3). This organisation has undertaken several campaigns to remove debris from the seabed in the southern North Sea and has identified the Brown Bank and the waters off the northern coast of Belgium and France as areas which contain relatively high (for the North Sea) levels of marine debris, primarily lost fishing nets.

28. The Norfolk Projects will provide funding equivalent to that required for two DDNZS campaigns in 2024, one to each of the locations mentioned above. During these, DDNZS will remove as much marine debris as they are able to within the time constraints of the trip. It has been estimated that these two campaigns will result in a combined total of 9,000kg, representing an area of 5.28ha, of marine debris being removed.

29. Due to the fact that both Ghost Fishing UK and DDNSZ use divers (many of whom are marine biologists) to undertake the work, any impacts on the marine environment will be extremely limited and the benefits significant. Further detail is provided in sections 3.3.4.2 and 3.4.4.2.

30. The Norfolk Projects has also sought advice from academics at Plymouth University (including the founder of the International Marine Litter Research Unit) and Newcastle University, on the most efficient ways of removing marine debris. Their advice, is that the clean up approaches which are already easily available such as the hand picking of litter from beaches, are likely to be the most effective, in terms of quantities removed in the UK, cost of removal, minimal environmental damage and wider benefits including educational value of those involved. Any such efforts should target items which are large enough to be collected by hand before they break down into micro- and nano-plastics. (Richard Thompson pers. comm., 2024). Therefore,

[5] https://www.duikdenoordzeeschoon.nl/

The Norfolk Projects has formed partnerships with Keep Britain Tidy (KBT) and Norfolk Beach Cleans (NBC) in order to organise and undertake over 200 beach cleans during 2024 (work stream 4). Through these beach-cleans it is predicted that 4,124kg of material which has originated from the marine environment and is likely otherwise to return there, will be removed. 4,124kg of material would equate to an area of 0.978ha. Further detail is provided in section 3.5.

31. In order to remove debris from the sea surface The Norfolk Projects propose to collaborate with The Ocean Cleanup[6] to remove plastics which accumulate in certain areas of sea (work stream 5). The Ocean Clean up has informed The Norfolk Projects that the North Sea is highly unlikely to contain enough floating plastics to allow the removal of 10.7ha worth of material. However, The Ocean Cleanup has been conducting a significant amount of work identifying where in the oceans the highest densities of marine plastic exist. Therefore, in order to deliver the required quantum of debris removal stipulated in the DCOs, and achieve additional environmental benefit through removing the most plastic possible, The Norfolk Projects propose to fund a campaign aimed at removing nearly 40,000kg of plastic from the Great Pacific Garbage Patch (NPGP)[7]. It has been calculated that removing this amount of material would equate to an area of 72.9ha and therefore would exceed the 10.7ha requirement five times over. Further detail is provided in section 3.6.

32. Together these five work streams, which are illustrated in Figure 2.1, will combine to remove significantly more than 10.7ha worth of marine debris and by working with its five partners, The Norfolk Projects will meet the benthic compensation requirements and deliver significant environmental benefits as summarised in Figure 2.1 below.

[6] https://theoceancleanup.com
[7] The Great Pacific Garbage Patch is a collection of marine debris in the North Pacific Ocean. Also known as the Pacific trash vortex, the garbage patch is actually two distinct collections of debris bounded by the massive North Pacific Subtropical Gyre (National geographic website)

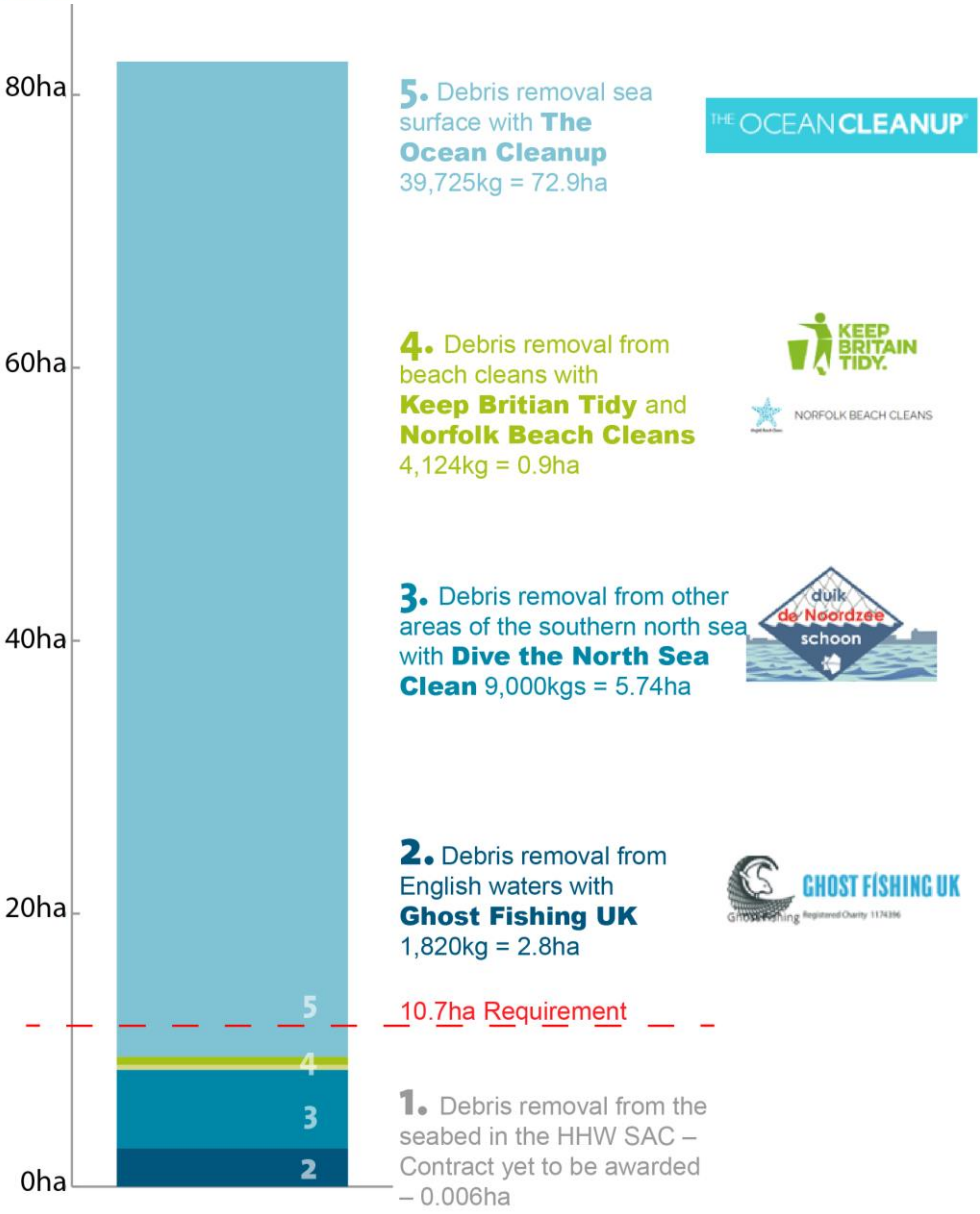


Figure 2.1 Marine debris removal work streams and partners

2.2 Overview of compensation strand 2: Education, awareness and provision of facilities to limit further marine debris

33. 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. Or put in other words, to stem the flow.

34. In order to discharge this second strand, The Norfolk Projects is collaborating with the East of England Plastics Coalition, Marine Debris Working Group (herein referred to as EEPC) and the Eastern Inshore Fisheries Conservation Authority (EIFCA) to organise and deliver a marine debris recycling campaign.

35. With a well-developed network within the fishing and recycling communities, good local geographical knowledge and a completed marine debris pilot project, the EEPC

and the EIFCA are well placed to support The Norfolk Projects with this strand of its compensation.

36. 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, subject to BIMP approval. Further detail is provided in section 4. By working with these partners, as illustrated in Figure 2.2, The Norfolk Projects is confident that significant environmental benefits will be realised in preventing debris from entering the marine environment.

Figure 2.2 Marine debris education, awareness and facilities to limit further marine debris

3 STRAND 1: IDENTIFICATION AND RETRIEVAL OF MARINE DEBRIS

37. The Norfolk Boreas and Norfolk Vanguard DCOs both state that the BIMP:

> must include provision for:
> (a) the identification and retrieval of marine debris;

38. As described above and in response to the SoS's letter dated 30 October 2023, The Norfolk Projects now propose five separate work streams for marine debris removal:

- Work Stream 1: marine debris removal from the HHW SAC (section 3.1);
- Work Stream 2: marine debris removal from English waters (section 3.3)
- Work Stream 3: marine debris removal from other parts of the southern North Sea (section 3.4)
- Work Stream 4: marine debris removal from beaches in southeast England (section 3.5); and
- Work Stream 5: marine debris removal from the sea surface (section 3.6).

39. The combination of these five work steams will satisfy the conditions of the Benthic Compensation Schedules by removing significantly greater than 10.7 hectares of debris from the marine environment. Further detail on each of these work streams is provided in the remainder of this section.

3.1 Marine debris removal from the HHW SAC

3.1.1 Target criteria

40. 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[8]:

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 within 50m of identified Annex I Sabellaria *Sabellaria spinulosa* (*S. spinulosa*) reef would not be removed;

[8] Due to the fact that the other work streams (2 to 5) do will be carried out in different locations, using other techniques the target criteria described here will not apply. A target criteria for each of the other work streams is identified in the relevant sections.

d) Targets are likely be larger than 1m in size (width or length) 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.

3.1.2 Identifying known existing targets within the HHW SAC

41. As The Norfolk Projects offshore cable corridor crosses the HHW SAC, data was collected during survey campaigns in 2016 and 2020 from within the HHW SAC. These surveys cover approximately 108.6km² of the SAC (Illustrated in Figure 3.1 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 marine debris targets within this area, only 6 of which are likely to be retrievable[9] and when the target criteria described in section 3.1.1 is applied, this number would be expected to reduce further. This exercise demonstrated that searching without direction would yield a very low number of possible marine debris targets (in this instance less than 0.06 targets per km^2) and therefore work would be needed 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 undertook the heatmapping work described in section 3.1.3 and deployed further survey campaigns set out in section 3.1.5, to identify higher densities of targets within the HHW SAC for a more efficient removal campaign.

3.1.3 Identifying areas for search

42. 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).

43. The methodology uses a systematic, score-based approach using data to identify higher 'scoring' blocks measuring $1km^2$ (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

[9] It is not proposed that these possible targets form 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.

enables The Norfolk Projects to specifically target areas with the highest likelihood of marine debris presence in order 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.

44. 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^2 '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.

45. Following the output of the above mapping exercise, a Primary AoS was then selected using the highest scoring blocks (Figure 3.1). This area was selected as it sits among the hottest (red) parts of the HHW SAC and there are no known wrecks within it which would 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 debris build up in the area.

46. 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 3.1). This secondary AoS was originally proposed as adaptive management (and referred to as such), as, at that stage the quantity and size of debris targets was unknown. 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 the secondary area of search. The results from the subsequent survey work, as described in section 3.1.5, indicate that it is likely that marine debris removal will be required from both areas, and thus it is referred to in this document as the Secondary AoS rather than as adaptive management (see section 3.1.5 for further detail).

47. 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 have developed a decision tree (see section 3.1.6.1 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 was 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. In other words, The Norfolk Projects has implemented a strategy that has the best chance of finding marine debris.

48. This process of identifying marine debris hot spots is described in full in Annex 3, which includes details of the data sources used and a detailed methodology of how both the Primary and Secondary AoS (termed the adaptive management AoS in that Annex) were determined.

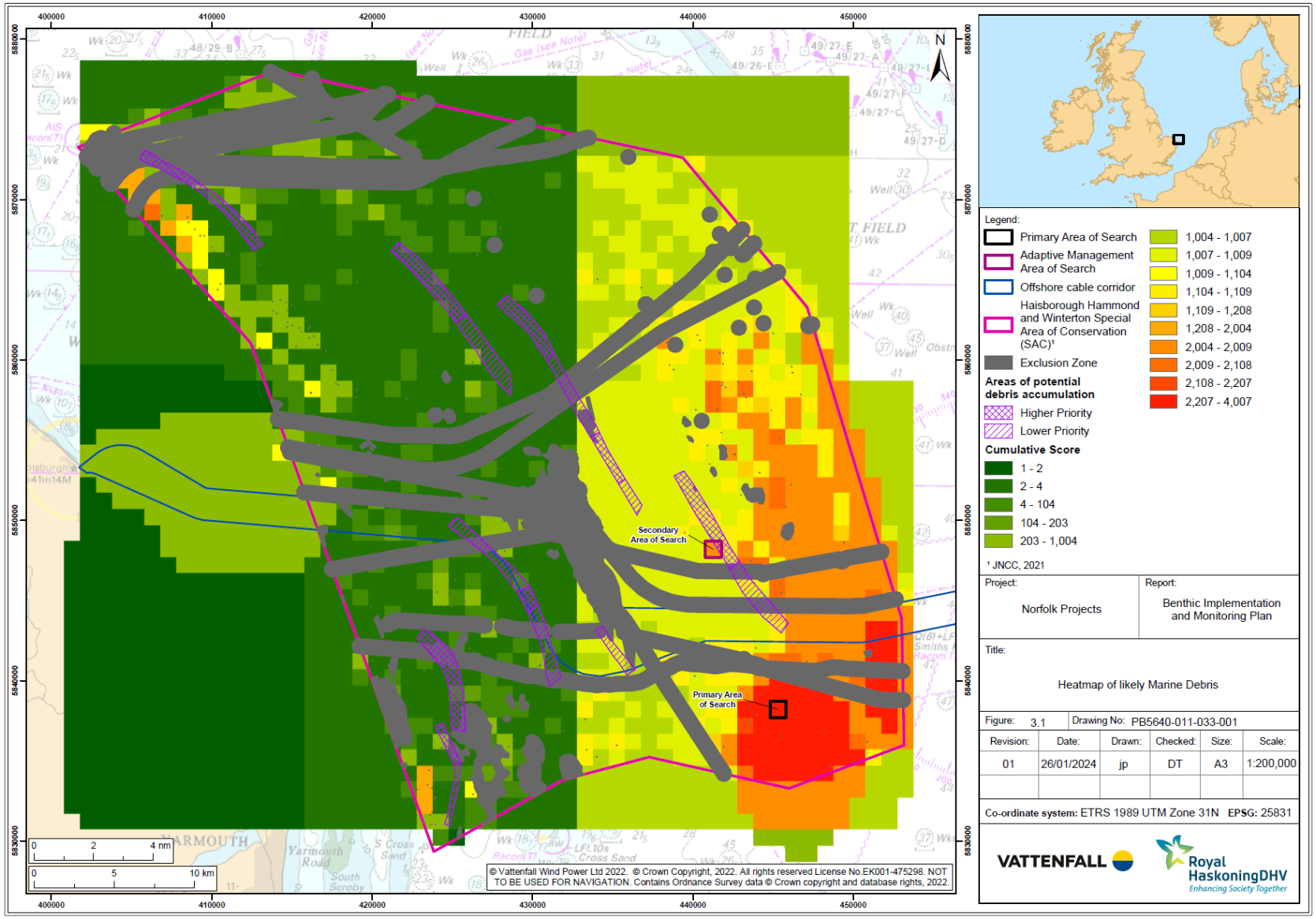


Figure 3.1 Heatmap of likely marine debris accumulation and identified Areas of Search (AoS)

3.1.4 Surveying the areas for search

49. High resolution geophysical seabed data (hull mounted Multibeam Echosounder (MBES) and towed side-scan sonar (SSS)) has been acquired during surveys of the AoS in September 2022. The surveys were conducted 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 comprises:

- 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.

50. The MBES and SSS data underwent preliminary processing offshore to identify targets and then underwent further processes onshore to estimate the size and shape of the targets.

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

3.1.5.1 Data Review & Target Assessment

51. The processed data has been provided by the survey contractor to The Norfolk Projects, along with information about each target (including exact location, likelihood of being debris, and estimated size of object) with supporting imagery. This information has been reviewed by The Norfolk Projects and further analysis will be completed by the specialist contractors comprising a seabed removal expert, Benthic Ecologist, UXO Expert and Archaeologist in preparation for the HHW SAC debris removal campaign.

52. Debris items which are present in sites of archaeological value (for example, debris associated with historic wrecks) have been excluded by a 50m buffer that has been applied around wrecks to prevent accidental damage during debris removal.

3.1.5.2 Details of the targets

53. As a result of good weather conditions during survey, both the Primary and Secondary AoS were able to be surveyed as well as additional areas surrounding each. Therefore, the survey comprised a total area of just under 6km^2. From the surveys carried out in September 2022, targets have been identified in both the Primary and Secondary AoS and these are shown in Figure 3.2.

54. From the Primary survey area, a total of 21 possible marine debris targets were identified, six of these are located within the original Primary AoS with a further 15 being located within the additional search areas (Figure 3.2). The Norfolk Projects propose to pursue all identified targets within or adjacent to the Primary AoS (the 21 green dots shown in Figure 3.2) and will remove as many of these as possible whilst

remaining within the target criteria outlined in section 3.1.1 and using the decision tree protocol (described below in sections 3.1.6.1.2 and 3.1.6.1.3) which has been developed and agreed by the BSG.

55. Analysis of the Secondary AoS data set has revealed a total of 11 possible marine debris targets within the surveyed area, six of these are within the original Secondary AoS with a further 5 being located within the vicinity (Figure 3.2). The Norfolk Projects propose to pursue all identified targets within or adjacent to the Secondary AoS (the 11 red dots shown in Figure 3.2) and will remove as many of these as possible whilst remaining within the target criteria outlined in section 3.1.1 and using the decision tree protocol (described below in sections 3.1.6.1.2 and 3.1.6.1.3) which have been developed and agreed by the BSG.

56. In comparison with the less than 0.06 targets per km^2 density of marine debris identified with the offshore cable corridor (see section 3.1.2), the Primary AoS and Secondary AoS exhibit much high densities of approximately 5.3 targets per km^2 combined, thereby verifying the marine debris heat mapping exercise contained within Annex 3.

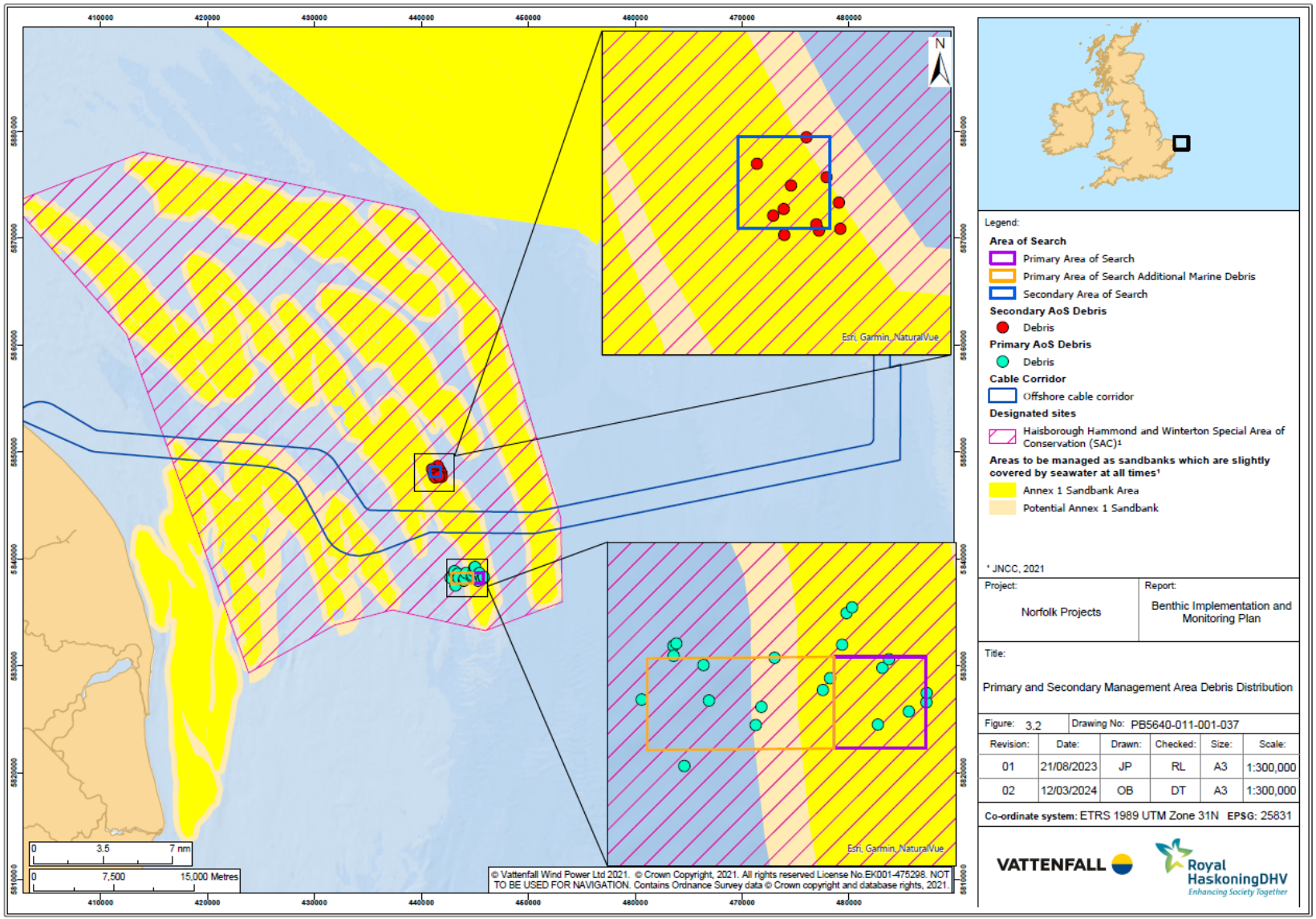


Figure 3.2 Marine debris targets within and adjacent to the Areas of Search (AoS)

Table 3.1: Primary AoS Target Details

ID	Location		Estimated length (m)	Estimated width	Estimated area m²
	X	Y			
10477_DS_SSS_0001	442723.8	5838245	1.1	0.5	0.55
10477_DS_SSS_0008	443070.5	5838831	3.0	0.9	2.7
10477_DS_SSS_0009	443071.8	5838722	0.6	0.4	0.24
10477_DS_SSS_0011	443102	5838856	0.6	0.3	0.18
10477_DS_SSS_0015	443189	5837519	1.3	0.3	0.39
10477_DS_SSS_0018	443398	5838621	1.3	0.3	0.39
10477_DS_SSS_0019	443458	5838234	1.0	0.5	0.5
10477_DS_SSS_0027	443968.5	5837966	2.9	0.9	2.61
10477_DS_SSS_0028	444030.3	5838165	1.5	0.3	0.45
10477_DS_SSS_0031	444173.9	5838700	1.7	0.6	1.02
10477_DS_SSS_0034	444700.9	5838349	2.4	0.6	1.44
10477_DS_SSS_0035	444778.9	5838478	1.5	0.4	0.6
10477_DS_SSS_0037	444910.9	5838843	3.0	0.5	1.5
10477_DS_SSS_0038	444958.9	5839189	2.4	0.8	1.92
10477_DS_SSS_0040	445019.5	5839251	0.5	0.6	0.3
10477_DS_SSS_0043	445300.7	5837972	1.0	0.7	0.7
10477_DS_SSS_0044	445350.1	5838591	1.1	0.3	0.33
10477_DS_SSS_0046	445421.7	5838685	10.	0.7	1
10477_DS_SSS_0047	445639.1	5838115	2.2	0.7	1.54
10477_DS_SSS_0050	445830.4	5838215	1.5	0.5	0.75
10477_DS_SSS_0051	445832.8	5838316	1.1	1.2	1.32
				Total	**20.43**

Table 3.2 Secondary AoS Target Details

ID	Location		Estimated length (m)	Estimated width	Estimated area m²
	X	Y			
10477_DN_SSS_0002	441533.3	5848693.7	2.23	0.62	1.3826
10477_DN_SSS_0007	440993.4	5848404	5.39	0.85	4.5815
10477_DN_SSS_0010	441752.3	5848257.6	0.79	0.83	0.6557
10477_DN_SSS_0012	441364.8	5848167.2	0.57	0.27	0.1539
10477_DN_SSS_0013	441887.8	5847980.5	3.97	0.79	3.1363
10477_DN_SSS_0014	441285	5847909.8	1.85	0.66	1.221
10477_DN_SSS_0016	441170.5	5847838.4	3.27	0.44	1.4388
10477_DN_SSS_0021	441903.4	5847694.1	0.67	0.55	0.3685
10477_DN_SSS_0022	441669.7	5847674.6	2.2	0.91	2.002
10477_DN_SSS_0023	441291.4	5847627	4.69	4.33	20.3077
10477_DN_SSS_0024	441641	5847743	1.8	1.18	2.124
				Total	**35.248**

57. It is not possible to provide absolute certainty on the exact nature of the targets listed above, as this will only be known once the ROV has made visual contact with them, and the removal process has occurred. However, analysis of the MBES and SSS data indicates that the objects are a mixture of metal, plastics and rope, some of which could be fishing gear as one of the targets looks as though it may be a crab pot and one of the metal objects might be a collection of fishing weights.

58. The fact that the survey has only resulted in the identification of 32 targets (other items such as boulders were identified in the data however these were removed from the target list as they are not marine debris) across the Primary AoS and Secondary AoS and that these are estimated 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 (set out in Table 3.1 and Table 3.2), significantly less than one tenth of a hectare of debris would have been removed.

59. It is however important not to pre-empt the results of the removal campaign in the Primary and Secondary 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 (e.g., one of the targets such as the suspected fishing weights might be attached to a large amount of netting which has not been detected by the MBES and SSS equipment), the successful removal (see paragraph 69) of which would make a significant contribution to achieving the success criteria.

60. Information on the exact size and nature of the targets will be included within a report summarising the removal operations, as is described in section 3.10.1.

3.1.6 Method statement

61. Following the surveys of the Primary and Secondary AoS and buffers, a removal campaign will be mobilised in August or September 2024 with the intention of removing as many of the 32 targets as possible whilst staying within the confines of the target criteria (described in section 3.1.1) and the decision tree (explained in section 3.1.6.1.2). A Marine Licence application was submitted to the MMO in February 2024 to permit these operations to take place. The MMO has confirmed that the Licence application has been validated and assigned to the case team (see Appendix 3 of Annex 2 to this document).

3.1.6.1 Investigation & Removal

3.1.6.1.1 Vessel types and tools to be used

62. The ROV support vessel for these operations is yet to be confirmed, but Figure 3.3 shows the N-Sea Pathfinder which will be, or will be similar to, the vessel used for HHW SAC debris removal work. The N-Sea Pathfinder is 61.87m long with a beam of 12.80m, a water draught of 4.65m and an air draught (mast down) of 27.50m and has capacity for 40 people. She operates a Dynamic Positioning 2 (DP2) system of the type that will be used during the debris removal operation.

Figure 3.3 The N-Sea Pathfinder and Schilling Robotics HD Work Class ROV System

63. The ROV has yet to be confirmed, but this is likely to be, or be the equivalent of the Schilling Robotics HD Work Class ROV System shown in Figure 3.3. This ROV includes Station Keep Dynamic positioning capability and has a payload of 250kg.

64. Should any of the marine debris objects be too large or too heavy for the ROV to manage, the support vessel will be fitted with a crane which will likely have capacity to lift 25 tonnes at 10m.

3.1.6.1.2 Target Investigation and decision making

65. Each of the 32 marine debris targets will be approached by the ROV deployed from the ROV support vessel in a systematic order using the target list. Prioritisation may be determined (in accordance with the procedure described in section 3.1.5.1), by for example, the certainty of the nature of the targets or where there are clusters which could yield multiple successful targets.

66. Prior to the ROV interacting in anyway with the seabed an initial search will be conducted for the existence of Annex I Sabellaria reef and any other habitats and species of principal importance[10]. This search will consist of three 100m transects being flown by the ROV. Each transect will have the target at its middle point and therefore six separate lines will radiate out from the target (see Figure 3.4). The live video footage will be monitored by a benthic ecologist. The orientation will have been pre planned by the benthic ecologist whereby they will assess existing geophysical data from the debris search campaign (see section 3.1.4) to determine the locations surrounding the targets which are most likely to contain Sabellaria reef or other habitats and species of principal importance.

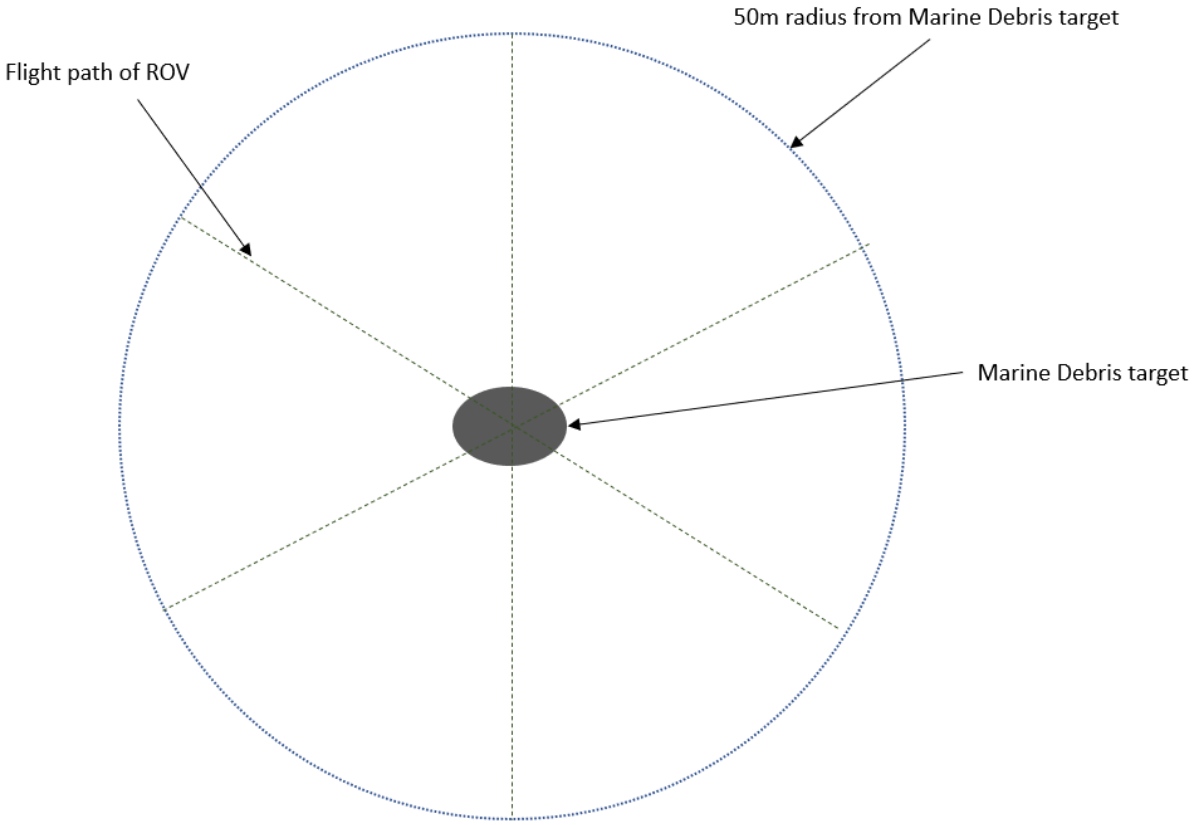


Figure 3.4 diagram showing search pattern for Annex I Sabellaria reef and other habitats of principal importance.

67. Once the search has been completed the ROV will acquire video data of each target. The Norfolk Projects Supervisor, Benthic Ecologist, UXO Expert, Archaeologist and ROV operator will review data from ROV cameras and decide if and how target

[10] Guidance on Habitats and species of principal importance in England available at https://www.gov.uk/government/publications/habitats-and-species-of-principal-importance-in-england

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).

68. A detailed decision tree has been developed and agreed with the BSG to show how the decisions for each target will be made. The decision tree is provided below in Figure 3.5 and will be used along with a further decision tree which has been developed to aid avoidance of Annex I Sabellaria (provided in Figure 3.6). The Marine Licence application (submitted in February 2024) includes both decision trees along with a full assessment of possible impacts to the environment concluding that there will be no significant effects. The mitigation measures within the licence application are summarised above, below and in section 3.3.4.2 and 3.3.4.3.

69. 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, up to approximately 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.

70. 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.

71. 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 have been met.

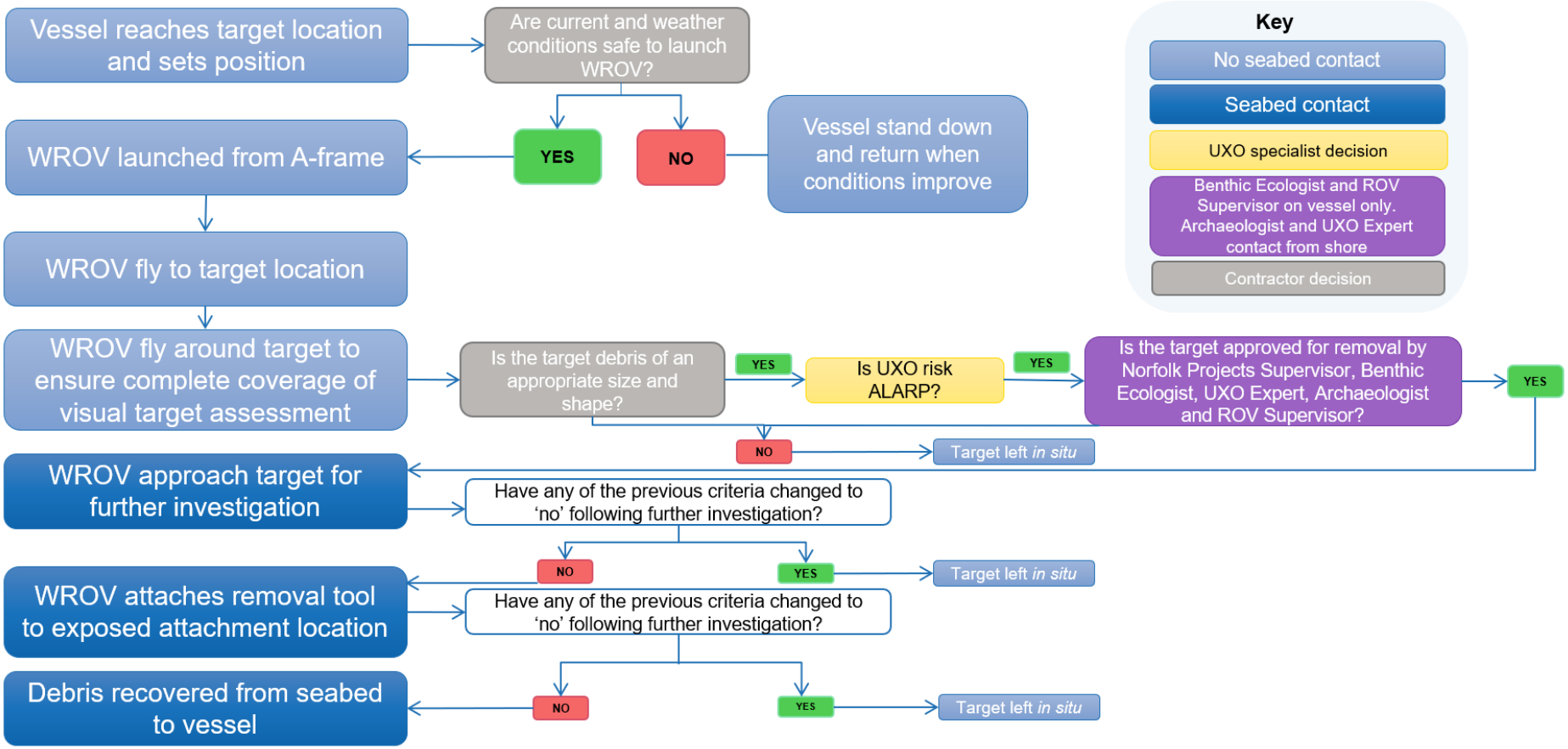


Figure 3.5 Debris removal decision tree with the process followed for Stage 1

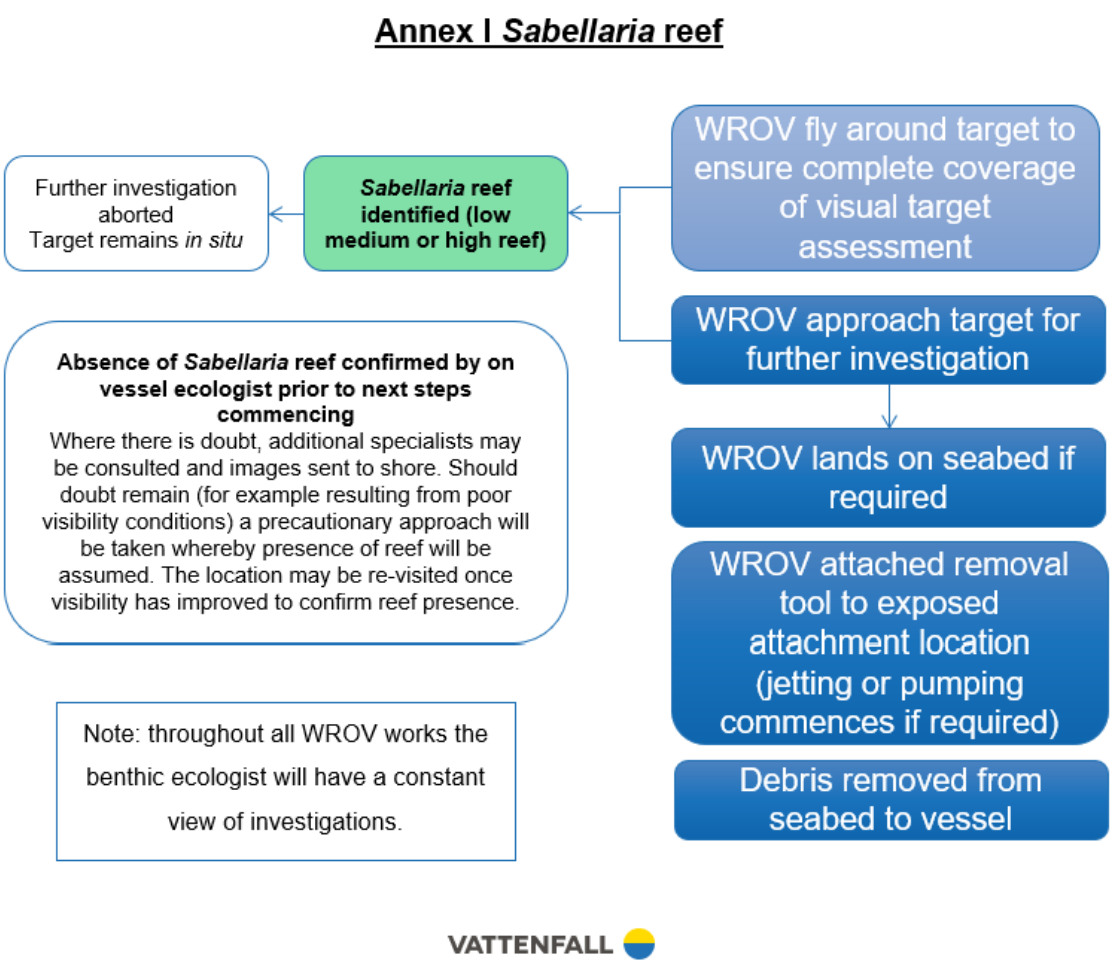


Figure 3.6 Debris removal decision tree showing process to be followed for Annex I *Sabellaria* reef

3.1.6.1.3 Removal

72. 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 250kg in weight and of a size which the ROV manipulators can manage.
- Vessel crane with grab attachment: weight capabilities will depend upon water depth (up to 25 tonnes at 10m), and there will be limitations in terms of debris length. This would be operated via deck controls with the potential for monitoring from the 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 for which the ROV cannot be used to bring onboard.

73. Although there may be some flexibility around the options listed above, the ROV only method 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 or winch.

74. 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.

75. Lifting capabilities of ROV, crane and winch equipment are anticipated to facilitate recovery of targets of considerable weight.

76. 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, but only down to a depth of 1m of sediment.

77. While the intention is to remove as many of the 32 marine debris targets 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.

78. Examples of reasons to abort recovery include:

- Level of Health, Safety, and Environment (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 or other sensitive benthic features.
- 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.

79. 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.

80. 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 3.10.1). 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).

3.1.6.2 Mitigating impacts to Annex I and Non-Annex I habitats and species

81. Preventing impacts to habitats and species has been a key consideration when designing the HHW SAC debris removal campaign. The Norfolk Boreas and Norfolk Vanguard Environmental Statements (Norfolk Vanguard Limited 2018a; Norfolk Boreas Limited 2019a) and Information to Support Habitats Regulations Assessments (Norfolk Vanguard Limited 2018b; Norfolk Boreas Limited 2019b) do not identify any species or habitats of principal importance within the offshore cable corridor apart from subtidal sands and gravels (analogous with the sandbanks which are a feature of the HHW SAC) and *Sabellaria spinulosa* reef. It is generally considered that these are the main habitats of concern within the HHW SAC.

82. As described in section 3.1.3, areas of known Annex I Sabellaria reef were excluded when identifying the search areas and therefore the likelihood of any targets being located in the vicinity of any Sabellaria reef has been reduced through design.

83. As described in section 3.1.6.1 and in accordance with Natural England's advice, ROV has been chosen as the method for undertaking debris removal. This method is the least harmful available. Other methods such as the use of grapnels and unassisted grabs are less precise and therefore would cause a greater impact. Furthermore, as described in section 3.1.6.1.1 video transects will be completed prior to any attempts to remove debris to ensure that no works are undertaken within 50m of Annex I Sabellaria reef. During these transects the on-board benthic ecologist will also identify any other habitats or species of principal importance and non-Annex I reef and should there be any risk of damaging these habitats the debris target would be abandoned.

84. The final layer of mitigation is described in section 3.1.6.1.2 and involves the benthic ecologist monitoring all removal attempts to ensure that no damage is occurring to any Annex I or non-Annex I reef or habitats and species of principal importance.

85. The mitigation measures to reduce/ remove impacts (summarised above and included within sections 3.1.6.1) have been developed in consultation with the BSG and the results of the assessment completed in support of the Marine Licence application have also been discussed during BSG meeting 5 (held on 5 December 2023). Following agreement on the mitigation measures no concerns have been raised and it is expected that the Marine Licence will be approved within the thirteen-week MMO determination period (the MMO have validated the licence

application as evidenced in Appendix 3 of Annex 2 of this document). On this basis, the SoS can be assured that any risk of impact to Annex I and non-Annex I reef and habitats and species of principal importance will be mitigated and managed via the marine licence applications process.

3.1.6.3 Disposal

86. 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.

87. A Waste Management Plan (WMP) for all debris removed has been developed and submitted in support of the Marine Licence application for the debris removal campaign which identifies the appropriate disposal pathways. These follow the waste hierarchy options preparing for re-use (such as returning pots to users), recycling, other recovery (such as incineration with energy recovery), and landfill disposal.

88. Should any lost/unmarked fishing gear be retrieved that still has identification tags attached, then this information will be provided to the EIFCA 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).

3.2 Marine debris removal outside of the HHW SAC

89. Marine debris has not been identified as a pressure on the HHW SAC (JNCC 2023) and during the Norfolk Boreas examination Natural England informed that marine debris is currently not hindering the conservation objectives of the HHW SAC[11]. Furthermore concerns have been raised about marine debris removal causing harm to the HHW SAC (See Natural England entries in the agreement log Appendix 2 of Annex 2).

90. As shown in Table 3.1 and Table 3.2 the combined total area of debris that has been identified during surveys which cover nearly 6km^2 is 55.7m^2. As described in section 3.1.3 the surveys used to identify these debris items were targeted at areas within the HHW SAC which are likely to contain the highest density of marine debris. Despite this, the predicted area of 55.7m^2 is only 0.019% of the 10.7ha requirement

[11] EN010087-002852-EN010087 351731 Norfolk Boreas Annex 1 Natural England advice on HHW SAC in principle compensation measures final.pdf (planninginspectorate.gov.uk) [Point 8 on page 3]

set by the Benthic Compensation Schedules within the DCOs. Furthermore, it is highly unlikely that all of the items can be removed whilst operating within the constraints of the mitigation (see section 3.1.6.2).

91. Further to the marine debris search surveys completed in 2022 and reported on in section 3.1.4, The Norfolk Projects has completed more debris identification surveys in 2023 within other areas of the HHW SAC and also within the Inner Dowsing, Race Bank and North Ridge (IDRBNR) SAC. These surveys were informed by the heat mapping exercise described in Annex 3 and a separate heat mapping exercise which was completed for the IDRBNR SAC, using an identical methodology to the one carried out for the HHW SAC. During these surveys 5.2km^2 was covered within the HHW SAC and 3.7km^2 was covered within the IDRBNR SAC. Preliminary results from these surveys have identified 18 items of marine debris within the HHW SAC and 21 within the IDRBNR SAC. This equates to 3.5 and 5.7 debris items per km^2 in the HHW and IDRBNR SACs respectively. This is very similar to the original HHW SAC survey results, which had a debris rate of 5.3 items per km^2. Although only preliminary results are available for the 2023 surveys, the marine debris items are all thought to be small (having a seabed footprint area of around 1m^2 to 2m^2) and consist mainly of items such as fishing pots.

92. The SoS's letter of 30 October 2023 reported that Natural England's conclusions regarding Hornsea Projects Three's experience of debris removal from the North Norfolk Sandbanks and Saturn Reefs (NNSSR) SAC and The Wash and North Norfolk Coast (WNNC) SAC was as follows:

"*There was a high probability that there would be insufficient marine debris to meet the DCO requirements. NE [Natural England] considered the requirement to remove marine debris in other sites will also be ineffective based on debris removal campaigns in other Southern North Sea marine protected areas and estimated that the effort involved was likely to outweigh the environmental benefit of debris removal due to the CO_2 footprint of the campaign*."

93. Hornsea Project Three has shared the results of its marine debris removal campaign with The Norfolk Projects. The Norfolk Projects understands that DESNZ has also received a copy of the report which is available by written request to Ørsted. The campaign within the NNSSR SAC was very successful in removing marine debris from the seabed and therefore delivering Hornsea Project Three's benthic compensation requirements of clearing an area of seabed[12]. However, based on the number of items identified that were suitable for removal and the size of those objects, it would

[12] It should be noted that the requirement for Hornsea Project Three is to clear an area of marine debris whereas the requirement for the Norfolk Projects is to remove an area (10.7ha) of marine debris.

not be possible to achieve the 10.7ha quantum of marine debris removal required to discharge the Benthic Compensation Schedules for the Norfolk Projects.

94. Hornsea Project Three undertook surveys that were guided by a similar heat mapping exercise to that described in section 3.1.3 and Appendix 3. Two areas within the NNSSR SAC were surveyed which together totalled an area of 1,118ha. From within these two areas, debris was removed at a ratio of 0.9 items per 100ha from area (N)1 and 1.9 items per 100ha from area (N)2.

95. The Norfolk Projects has calculated that debris was removed at a ratio of approximately 0.09m^2 per hectare surveyed. Based on this The Norfolk Projects would need to survey and retrieve debris items from approximately 1,255,257ha (or 12,553km^2) of seabed in order to remove 10.7ha of marine debris. It should be noted that this is an optimistic estimate as the search has been informed by a heatmapping exercise targeting areas of high likelihood of marine debris.

96. Taking into account the evidence gathered by The Norfolk Projects in the HHW and IDRBNR SACs and Natural England's statements made regarding the experience within the NNSSR and WNNC SACs (as contained within the SoS's letter of 30 October 2023), it is highly unlikely that there will be enough debris, which can be removed within the HHW SAC, or nearby SACs designated for the same features. The Norfolk Projects has therefore identified other work streams to enable the removal of 10.7 hectares of marine debris from the marine environment. These other work streams are described in sections 3.3, 3.4, 3.5, and 3.6 below.

97. To substantiate this position further, it should be noted that Hornsea Project Three also concluded in its marine debris removal report that: "*the effort, in terms of vessel time and man hours, for the debris campaign was high. Together, the operational time for the geophysical survey and WROV investigation totalled around 450 hours (almost 19 days) at sea – this figure doesn't include the substantial additional time for transit, crew transfers, port calls and mechanical and weather downtime. Taking this into account, the overall cost per item of debris recovered would appear to be disproportionately high. For similar compensation packages in the future, therefore, the value of including debris removal campaign as a measure could be re-evaluated and additional focus placed on debris awareness campaigns and less onerous debris removal (e.g. beach cleans, removal of floating debris, collaboration with fishing vessels that retrieve debris during trawling activity*)."

3.3 Marine debris removal from English waters

98. Ghost Fishing UK is a British charity dedicated to removing Abandoned, Lost, and Discarded Fishing Gear (ALDFG) known as 'Ghost Gear'. The organisation consists of volunteer scuba divers that work to remove, where possible, lethal entanglement hazards to marine life from the marine environment. Ghost Fishing UK was established in 2015 and has a proven track record in removing gear on numerous successful operations, for example in 2023 it removed 1,500kg of ALDFG from around the coast of Shetland (Dive Magazine 2023) during a single week long campaign.

99. If not removed, ghost gear can pose a significant threat and cause substantial harm to marine life indefinitely. Lost lobster pots have been observed by divers from Ghost Fishing UK as remaining functional up to 18 months after their loss, with fresh catch and remains present within the pots. Megaplastics (such as those which make up monofilament nets) in the marine environment pose a high risk of entanglement, for example nets suspended in the water column can continue to pose entanglement threats until they are bundled on the seafloor. Suspended trapped fish act as bait for predators and scavengers to also become trapped within (as shown in Figure 3.7).

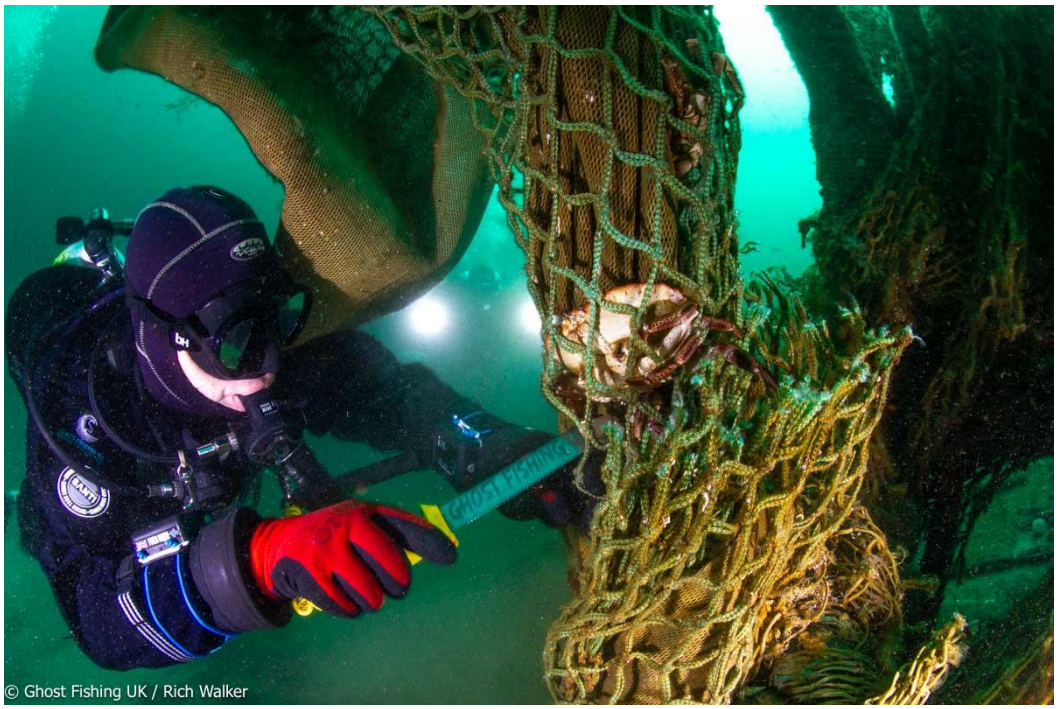


Figure 3.7 A diver from Ghost Fishing UK frees a crab from a net. Ghost Fishing UK.

100. A project funded by the World Wide Fund for Nature (WWF) called Germany's ghost gear project (Stolte *et al.,* 2022) observed gillnets acting in this way which were overgrown with algae and contained fish skeletons as well as fresh fish and birds, implying this trap for fauna had been in place for many months. Over centuries, ALDFG can slowly degrade into microplastic fibres and particles, which upon entering

the food web have detrimental effects. Removal of ALDFG where possible can act to somewhat mitigate these effects by removing these hazards from the marine environment.

101. Ghost Fishing UK campaigns to remove the ALDFG are conducted by volunteer divers. Campaigns have been conducted in England and Scotland since 2015. The Norfolk Projects will collaborate with Ghost Fishing UK and provide funding to allow further marine debris removal campaigns in English waters. The remainder of this section (section 3.3) provides details of the work that will be undertaken by Ghost Fishing UK (subject to timely approval of the BIMP). Ghost Fishing UK are in agreement with this proposal, as demonstrated by the signed letter of intent presented in Annex 6.

3.3.1 Target criteria

102. Between 2,000 and 12,000 tonnes of fishing gear waste are estimated to enter the European seas each year (Eunomia 2016). Ghost Fishing UK activities are intended to positively benefit the marine environment by removing harmful ghost gear from it and targeting recovering of ALDFG which continues to catch after loss and results in the death or damage of marine life. The vast majority of this is fishing nets of all types, many of which are demersal or benthic trawl nets, but lighter gill nets are also often found and retrieved and depending on the location, pots are also retrieved in some cases.

3.3.2 Identifying areas of search

103. Ghost Fishing UK are able to operate anywhere in UK waters and rely on reports from both recreational divers and fisherfolk to identify hotspots with higher amounts of debris to target on campaigns. Ghost Fishing UK have formed a close relationship with the fishing community which results in information being passed to them on lost gear. In return Ghost Fishing UK often charter fishing vessels to aid their operations.

104. Ghost Fishing UK have identified eight possible opportunities for debris removal trips in UK waters, which, with funding from The Norfolk Projects can be progressed in 2024. These target areas have been identified through Ghost Fishing UK's diver reporting system and have been on their list of possible dive locations for some time but due to a lack of funding have not been progressed.

105. Ghost Fishing UK also undertake emergency response operations to retrieve ghost nets which are reported to be causing immediate and significant harm to marine life. The Norfolk Projects will provide funding which will enable a further two emergency response or ad-hoc additional trips so these can be organised during 2024 if required.

3.3.3 Details of the location, nature and size of debris

106. Of the eight trips, as shown in Figure 3.8, two of these would be in waters around Plymouth, two off the coast at Brighton and four further operations off the East coast of England. It is currently anticipated that the East coast operations would include: The wreck of the SS Eston located off the coast near Whitby, where trawl nets have been reported; The wreck of the SS Mars, located off Tynemouth, where trawl nets and monofilament nets have been reported snagged on the wreck; multiple dive sites around the Farne Islands where various fishing gear has been reported; and several locations off Scarborough also where a variety of different fishing gear has been reported.

107. Although not yet confirmed, the two operations planned for Brighton and two for Plymouth will target trawl and monofilaments nets which have been reported at wreck sites. These include the Zaanstroon off Brighton and the HMS Scylla off Plymouth.

108. In addition to these sites, Ghost Fishing UK also react quickly to new reports of abandoned fishing gear and often organise emergency response operations to remove these reported cases as soon as it is possible to do so. These emergency operations are usually to retrieve lightweight mobile nets such as gill and monofilament nets as they are the most deadly for marine life and can also move from location to location with the prevailing current.

109. Ghost Fishing UK are currently liaising with divers in Norfolk with the intention of undertaking fishing gear removal operations off the Norfolk coast. Ghost Fishing UK are delivering training to these divers and the goal is that gear removal operations will be organised in the near future. If these intended operations do occur in 2024 then the funding provided by The Norfolk Projects for the emergency or ad-hoc trips will be used to fund these operations in coastal waters off Norfolk.

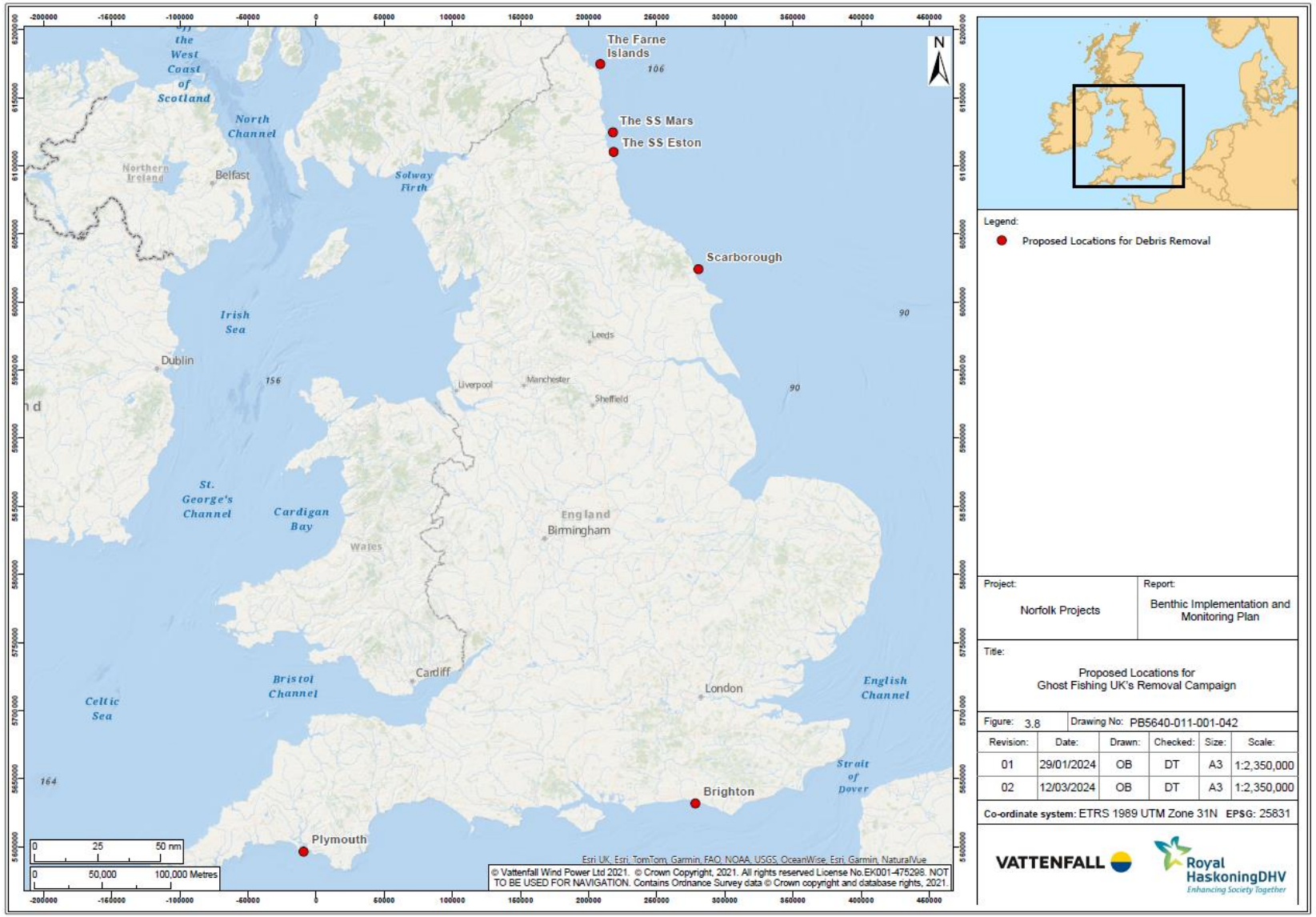


Figure 3.8 Map showing the proposed locations for Ghost Fishing UK's removal campaigns

3.3.3.1 Likely quantities and conversion to area impacted.

110. As set out above, The Norfolk Projects proposes to provide equivalent funding to allow Ghost Fishing UK to undertake all eight campaigns to remove fishing gear from the locations described above and presented in Figure 3.8 and would also provide equivalent funding for a further two emergency response or ad-hoc operations that are arranged during 2024.

111. Ghost Fishing UK, on average, retrieve between 70kg to 100kg a day of nets and over the eight campaigns listed above (which are estimated to take 22 days) as well as two emergency response operations (estimated to take two days each) it is anticipated that a total of at least 1,820kg of material would be removed.

112. Although the nets are usually gathered on wrecks or other seabed obstacles (see section 3.4.4.2 for how impacts are mitigated), should that material become free it would have the potential to spread out on the seabed and cause a large area of impact. Netting therefore has the potential to impact a very large area compared with its relative weight (see Figure 3.9).

113. Ghost Fishing UK target almost exclusively fishing net and therefore it is predicted that all of the material removed is likely to be fishing net. Pots and other fishing gear (weights, buoys, rope etc.) are occasionally retrieved but it is the net (including gill net, trammel net, trawl nets and others) which is targeted by Ghost Fishing UK as that causes the greatest environmental damage.

Figure 3.9 photographs of a net being retrieved by Ghost Fishing UK and a photograph of a net spread out to show the maximum area that it could affect at any point in time.

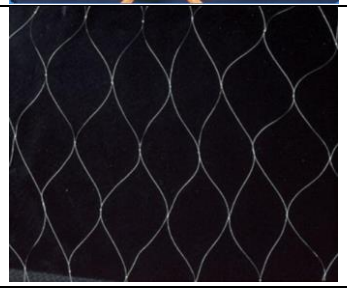
114. Using this information and by conducting a search of the average dimensions and weight of fishing net of the type which Ghost Fishing target, The Norfolk Projects has calculated an area in metres squared per kilogram (m^2/kg) of weight and these are displayed in Table 3.3. When estimating this value, The Norfolk Projects has taken seven examples of the types of nets used in UK waters and calculated the mean

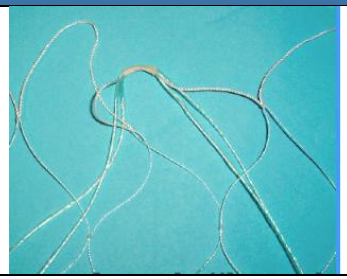
value of the conversion rate which is **15.312**m^2 per kg, i.e., for every kilogram of net retrieved this would contribute just over 15.312m^2 towards the required debris removal area.

115. Using these conversion rates, it can be demonstrated that 1,820kg of net (as expected to be retrieved during the eight trips plus two emergency response or ad-hoc operations) would result in approximately 2.8ha which is 26.06% of the 10.7ha target. Further information on the formula used to calculate the size of a net is provided in Annex 11.

Table 3.3 Calculations of area of effect.

Item	Details	Weight (kg)	Length (m)	Width (m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
10/27 (1.9mm) Twisted HDPE Trawl Netting 82mm inside mesh Orange	 DESCRIPTION • 0.30 Silver Grey Monofiliment Inner • 100mm Full Mesh Stretched • Inner Double Selvedge Top and Bottom • 1.5x12 Light Green Multi-Monofiliment Walls • When rigged this net will fish 100yds long and 10ft deep To buy this net rigged please click here	13	8.2	4.10	33.62	2.586	41,374
Twisted HDPE Trawl Netting	 DESCRIPTION 10/27 (1.9mm) Twisted HDPE Trawl Netting 82mm inside mesh Orange **Bale Size/Weights** 125ML X 100MD/5.12KG 250ML X 100MD/10.25KG 500ML X 100MD/20.5KG 1000ML X 100MD/41KG	5.12	10.25	8.2	84.05	16.416	6,518
3mm Braided Ocean Compact Netting	 DESCRIPTION 3mm Braided Twine 82mm Inside mesh Ocean Compact HDPE Netting **Bale Weights** 50ML X 100MD 5.6KG 100ML X 100MD 11.2KG 250ML X 100MD 28KG	5.6	4.1	8.2	33.62	6.004	17,823

Item	Details	Weight (kg)	Length (m)	Width (m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
4MM BRAIDED 82MM INSIDE MESH OCEAN COMPACT NETTING	 DESCRIPTION 4mm Braided Twine 82mm Inside mesh Ocean Compact HDPE Netting **Bale Weights** 50ML X 100MD 10KG 100ML X 100MD 20KG 250ML X 100MD 50KG	10	8.2	4.1	33.62	3.362	31,826
10/39 (2.3MM) 82MM INSIDE MESH ORANGE	 DESCRIPTION 10/39 (2.3mm) Orange Twisted PE Trawl Netting **Bale Size/Weights** 125ML X 100MD/7.5KG 250ML X 100MD/15KG 500ML X 100MD/30KG 1000ML X 100MD/60KG	7.5	10.25	8.2	84.05	11.207	9,548
RIGGED 0.30 X 100MM (4 INCH) BASS/MULLET NET	 DESCRIPTION • 0.30 Silver Grey Monofilament • 100mm Full Mesh Stretched • Double Selvedge Top and Bottom • 30MD = 8ft fishing depth • 50MD = 13ft fishing depth • 60MD = 16ft fishing depth When rigged by the half this net will fish 100yds	7.2	2.44	4.87	223.11	30.988	3,453

Item	Details	Weight (kg)	Length (m)	Width (m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
Grey Monofiliment May need to change back to 4mm braded ocean net	 DESCRIPTION • 0.30 Silver Grey Monofiliment Inner • 100mm Full Mesh Stretched • Inner Double Selvedge Top and Bottom • 1.5x12 Light Green Multi-Monofiliment Walls • When rigged this net will fish 100yds long and 10ft deep	7.6	91.44	3.048	278.71	36.672	2,918
					Average net	**15.319m^2**	**16,208.57**

3.3.4 Method statement for removal

3.3.4.1 Vessel types and tools to be used

116. Ghost Fishing UK use local skippers or have support from fishing vessels for their campaigns, some of which are reserved in the weeks leading up to the campaign, and so a definitive vessel specification cannot be provided at this stage. Campaigns typically charter a vessel with capacity for 12 people, which allows for up to nine divers and their required diving equipment and allows for the additional weight of any recovered debris. Figure 3.10 shows a vessel used for previous operations, a South Boat 11m catamaran commercially certified to carry 12 divers up to 60 miles offshore.

Figure 3.10 Photograph Scimitar - a representative vessel used by Ghost Fishing UK

117. Typically, two dives per day are conducted during campaigns depending on tides, with dive teams consisting of two or three appropriately qualified and trained divers. All team members attend a briefing from the project leader or boat leader and conduct pre-dive safety checks.

118. During dives ALDFG is detached from the seabed feature or wreck (if snagged) using hand tools such as knives, scissors, cable cutters or similar hand tools and added to bags or containers. Lifting bags are attached to the bags or containers and raised to the surface. Larger items are lifted directly with the lifting bags. At the surface, debris is typically manually hauled onto the vessel. If the vessel is equipped, cranes or winches are used to lift the debris onto the vessel.

119. Disposal of removed ALDFG once recovered to land is conducted responsibly. Where possible fishing gear is returned to the owner, and recycling is the preferred method of disposal. Where this is not possible and ALDFG is removed to landfill or disposal

sites, this is undertaken with cooperation from local authorities, harbour masters and transportation services as necessary.

3.3.4.2 Ensuring environmental impacts are minimised

120. Ghost Fishing UK has acquired all of the relevant agreements, licences and permits to undertake their marine debris removal operations in UK waters. Further information is provided in Annex 2.

121. All Ghost Fishing UK divers undertake a formal training course before joining any dive operations. Ghost Fishing UK have a method statement which has been agreed with Natural England and contains a protocol to be followed if sensitive or invasive species are encountered. This has formed part of Ghost Fishing UK's licences and exempt notifications, which allow them to work in Marine Conservation Zones (MCZs), Special Sites of Scientific Interest (SSSI), SACs, Special Protection Areas (SPAs) and Ramsar sites if required. Of the locations proposed to be targeted in 2024, it is only the Farne Islands which are located within an MPA. They sit within the Berwickshire and North Northumberland Coast SAC which is designated for a number of different habitats, however "Marine area Sea inlets" and "Shingle, Sea cliffs, Islets" are the only features occurring in the Farne islands.

122. All sites targeted for ALDFG removal must first have a full "site survey" dive completed prior to any attempt at removal activities. All divers conducting survey dives will have completed the formal training course which includes identification of local marine life. All divers will have had a briefing to ensure that any endangered, invasive, or sensitive species can be identified during the site survey dive. If endangered, invasive, or sensitive species are observed during these dives the species is recorded and photographed and left in-situ, and consultation with interested parties is undertaken where relevant to discuss the benefits or potential harm that may be caused by net retrieval.

123. The method of using hand tools such as diving knives to carefully free netting from an obstacle (see Figure 3.7 above) is the least damaging method possible and raising the netting to the surface using lifting bags will cause no additional impact to the benthic or marine environment. A protocol is in place for removing an item of ALDFG from natural features such as rocks, reefs or flora and the lifting sequence is adjusted to reduce forces applied to the features. Reasonable attempts will be made to free any living organisms caught in the gear (see Figure 3.7, where a diver is freeing an edible crab *Cancer pagurus*) before the gear is removed, within the boundaries of the law regarding protected species. If this is not possible during the dive, then the organisms would be returned to the water as soon as is practicable.

124. Silting is avoided by not removing any ghost gear that is buried in mud or silt when it poses no threat to wildlife. Ghost Fishing UK avoid removing man-made objects that are forming a habitat if it is not posing a risk to marine wildlife.

125. Ghost Fishing UK follow their own reporting obligations, which includes recording the condition of the site before and after the campaign, recommendations for further monitoring and the forwarding of reports to interested parties such as Natural England.

3.3.4.3 Ensuring impacts to heritage are minimised

126. Ghost Fishing UK's method statement (which supports the marine licence exemption granted by the MMO, see section 3.3.4.2 above) has been agreed with Historic England. This includes a protocol for removing ALDFG if entangled in the wreck of a ship, aircraft or other manmade structure and the reporting procedure that must be followed if any ALDFG is removed from a wreck. This includes the use of hand tools to free ALDFG from a wreck and adjusting the lifting protocol to reduce stress from wreck features. No part of the wreck or structure will be removed to the surface.

3.4 Removal from other parts of the Southern North Sea

127. As described above in section 3.2, there is unlikely to be enough marine debris within the HHW, IDRBNR or NNSSR SACs to successfully remove 10.7ha. By working with Ghost Fishing UK, as described above, a large amount of marine debris will be removed from English waters, however more is required to meet the 10.7ha requirement. Therefore, The Norfolk Projects has identified a second partner to collaborate with to remove debris from other parts of the southern North Sea.

128. Stichting Duik de Noordzee Schoon (DDNZS), the English translation of which is Dive the North Sea Clean Foundation is an organisation founded in 1999 with the aim of cleaning up the North Sea. DDNZS is a non-profit organisation started by experienced North Sea wreck divers. The organisation has grown in recent years, and they now undertake several large-scale campaigns each year. In addition to cleaning the North Sea, DDNZS inform recreational divers about the cultural-historical and biological aspects of the wrecks on the bottom of the North Sea and about the dangers of wasted fishing gear that has been left behind.

129. DDNZS is comprised of marine biologists, underwater filmmakers, photographers, archaeologists and volunteers who organise expeditions within the North Sea including to wrecks and natural reefs such as the Klaverbank and other locations. The research, films and photographs and other results of these trips are shared with the general public.

130. DDNZS has a proven track record of removing marine debris and, over the 20 campaigns which span 24 years, has removed 76,850kg of fishing net material, 26,450kg of fishing lead and 54,300m of fishing line from the North Sea. Therefore, The Norfolk Projects will collaborate with DDNSZ to undertake further marine debris removal campaigns. The remainder of this section (section 3.4) provides details of the work that will be undertaken by DDNZS (subject to timely approval of the BIMP). DDNZS are in agreement with this proposal, as evidenced by the letter of intent presented in Annex 7.

3.4.1 Target criteria

131. During DDNZS's previous campaigns in the North Sea over 90% of the material they have retrieved is fishing gear which has been lost or discarded. Due to the detrimental environmental impacts of lost fishing gear including its ability to continue to snag animals, it is this fishing gear that will be targeted for removal during the proposed campaigns.

3.4.2 Identifying areas of search

132. Based on DDNZS's previous experience and knowledge of existing data sets there are two areas within the southern North Sea which are likely to contain relatively large (in comparison with other parts of the North Sea) concentrations of marine debris. The first is known as the Brown Bank or Brown Ridge and the second is an area off the coasts of Belgium and France.

133. DDNZS are confident that using their existing experience the areas proposed for these two campaigns will contain significant quantities of lost fishing gear. Therefore, no further surveys will be undertaken for this work stream, and it will proceed directly to the removal stage.

3.4.3 Details of the location, nature and size of debris

134. The Norfolk Projects propose that two removal campaigns led by DDNSZ will target the locations shown within Figure 3.11. Campaign 1 will focus on the Brown Bank area but will also include dive stops on route to the Brown Bank and possibly on the return back to port.

135. The Brown Bank is located in the western part of Dutch waters within the North Sea. It is designated as a Natura 2000 area by the Netherlands and is known for its dynamic sediment seabed. The overall depth varies between 16 and 50 metres. Sandbanks and sand waves which can reach heights of up to 20 metres from the seabed are also found within the system. There are many large wrecks on the Brown Bank including some which will be visited during the DDNSZ campaign. As described in section 3.4.4.2, DDNZS has obtained all of the permits and licences they require to undertake the planned dives on the Brown Bank.

136. As a foundation, DDNZS have already completed many dives on the Brown Bank, and the area is familiar to many of the team. During previous dives DDNZS members have identified that there are many old fishing nets and fishing weights located on wrecks in the area.

137. As described above, the nature of the material targeted will be abandoned fishing gear including fishing nets, weights and lines. DDNZS have estimated that 4,500kg of fishing gear could be retrieved from the Brown Bank area during the campaign and the area this is calculated to affect is set out in section 3.4.3.1 below.

138. The second campaign, which will also be led by DDNZS, will target 17 sites located off the Belgium and French coasts, again the vast majority of the debris removed will also be fishing gear. This area has been popular with anglers and gill net fishermen for decades. Currently, fishing activity has been reduced due to a decline in stocks, but the nets and fishing sinkers are still plentiful. These nets continue to provide a

threat to the environment through ghost fishing. DDNZS completed campaigns here in 2022 and 2023, during which, although some fishing gear was removed, large quantities of additional fishing gear was identified which, due to lack of time available could not be removed during those dives. Therefore, DDNSZ are confident these dive sites will yield large quantities of material. DDNZS have estimated that the French and Belgium coast campaigns will also result in the removal of at least 4,500kg of marine debris. The equivalent area which that weight of fishing gear could affect is calculated in section 3.4.3.1 below.

139. The Brown Bank campaign is scheduled to take place from the 6th to the 13th July 2024 and the French and Belgium coast campaign is scheduled for mid-September 2024.

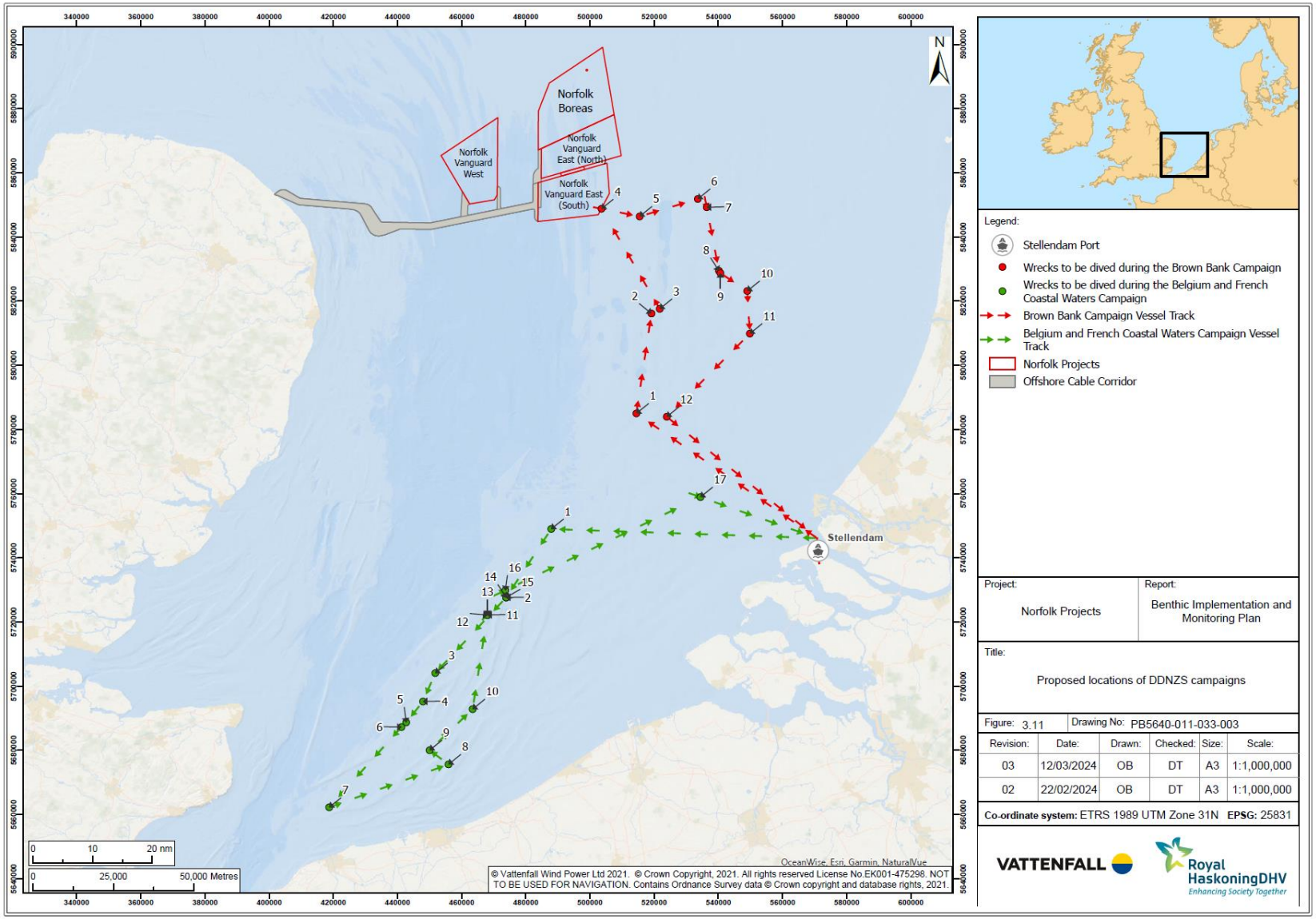


Figure 3.11 Map showing the proposed locations of the debris removal campaigns on the Brown Bank in waters off the French and Belgium coast

3.4.3.1 Likely quantities and conversion to area

140. In discussion with DDNZS, The Norfolk Projects has estimated that through a combination of the Brown Ridge campaign and the French and Belgium coastal waters campaign, at least 9,000kg of fishing nets and fishing lead will be retrieved.

141. Experience from previous removal campaigns carried out by DDNZS shows that upward of 90% of the material removed is likely to be fishing gear (ghost nets, crates, buoys etc.). Fishing equipment, especially nets have the potential to affect a large area if spread out (see Figure 3.12 below).

Figure 3.12 Photographs of a net being retrieved by DDNZS and a photograph of a net spread out to show the maximum area that it could affect at any point in time.

142. Other recovered items which DDNZS retrieve include lead weights used by sports fishermen. However, it is expected that during the Brown Bank and French and Belgium coasts campaigns lead weights would only comprise a very small amount of the haul and therefore are not considered in the conversion calculation.

143. Using this information and by conducting a search of the average dimensions and weight of the types of fishing net that DDNZS recover, an area in metres squared per kilogram (m^2/kg) of weight has been calculated. Table 3.4 provides the calculations used for the debris removal which will be undertaken by DDNZS in the southern North Sea. The metre squared value per kilogram has been calculated as **7.092**, i.e., for every kilogram of net retrieved this would contribute 7.092m^2. It should be noted that the set of nets used for the DDNZS conversion factor are different to those used for Ghost Fishing UK in section 3.3.3.1. The differences are because the two organisations generally recover a different grade of net, with DDNZS reporting a bias toward heavier benthic trawl type nets whereas Ghost Fishing UK report recovery of lighter nets including gill and monofilament nets (although there is some overlap in the lighter demersal trawl type nets). This difference is largely driven by the location in which they undertake their operations with DDNZS working further offshore and in Dutch waters where historically there has been significant amounts

of bottom trawling, and Ghost Fishing UK mostly operating near to shore where lighter nets are generally used.

144. Four examples of nets which are commonly sold for use in European waters have been used to calculate the mean value of the conversion factor. As explained above, DDNZS do not generally encounter gill nets, as Ghost Fishing UK do (see Table 3.4) and therefore, that type of net is not included. Using the conversion factor, it can be demonstrated that approximately 90% of 9,000kg worth of fishing material (such as can be expected to be retrieved from two campaigns) would result in approximately 5.74ha which is 53.69% of a 10.7ha requirement. The remaining 10% retrieved would be fishing weights which would not make a meaningful contribution to the required total (less than 0.0001 ha). Further information on the formula used to calculate the area of a net is provided in Annex 11.

Table 3.4 Calculations of area of effect

Item	Details	Weight (kg)	Length (m)	Width(m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
10/27 (1.9mm) Twisted HDPE Trawl Netting 82mm inside mesh Orange	 DESCRIPTION • 0.30 Silver Grey Monofiliment Inner • 100mm Full Mesh Stretched • Inner Double Selvedge Top and Bottom • 1.5x12 Light Green Multi-Monofiliment Walls • When rigged this net will fish 100yds long and 10ft deep To buy this net rigged please click here	13	8.2	4.10	33.62	2.586	41,374
Twisted HDPE Trawl Netting	 DESCRIPTION 10/27 (1.9mm) Twisted HDPE Trawl Netting 82mm inside mesh Orange **Bale Size/Weights** 125ML X 100MD/5.12KG 250ML X 100MD/10.25KG 500ML X 100MD/20.5KG 1000ML X 100MD/41KG	5.12	10.25	8.2	84.05	16.416	6,518
3mm Braided Ocean Compact Netting	 DESCRIPTION 3mm Braided Twine 82mm Inside mesh Ocean Compact HDPE Netting **Bale Weights** 50ML X 100MD 5.6KG 100ML X 100MD 11.2KG 250ML X 100MD 28KG	5.6	4.1	8.2	33.62	6.004	17,823

Item	Details	Weight (kg)	Length (m)	Width(m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
4mm Braided Ocean Compact netting	 DESCRIPTION 4mm Braided Twine 82mm Inside mesh Ocean Compact HDPE Netting **Bale Weights** 50ML X 100MD 10KG 100ML X 100MD 20KG 250ML X 100MD 50KG	10	4.1	8.2	33.62	3.362	31,826
					Average net	**7.092m^2**	**24,385kg**

3.4.4 Method statement for removal

3.4.4.1 Vessel types and tools to be used.

145. All divers who join DDNZS campaigns undergo training in how to undertake fishing gear removal. DDNZS administer this training and a contribution of funding towards training is covered in The Norfolk Projects offer to DDNZS.

146. Should this BIMP be approved, the MS Tender, pictured in Figure 3.13, will be used for the Brown Bank and the Belgium and French waters campaigns. The MS Tender is a fully equipped dive support vessel 42m in length, with a beam of 7m and a draught of 3.2m. She is also equipped with a crane for assisting retrieval of material from the sea.

Figure 3.13 MS Tender (vessel to be used on marine debris removal campaign on the Brown Bank)

147. For both campaigns the MS Tender would sail from the port of Stellendam and steam to its first dive location. All divers will operate under the highest health and safety standards. The team of approximately six divers will enter the water having undertaken the necessary safety checks and will descend to the wreck site. On identification of fishing net material, the divers will notify the boat-based staff personnel and instruct them to prepare for extraction.

148. The divers will undertake the necessary checks of the net to ensure it is suitable for extraction; this includes a safety check, and a check for any organisms that are

trapped or growing on the net. One of the team will then usually photograph the net, if a photographer is part of that particular dive team.

149. Using standard diving knives and following the procedures learnt during their training the divers will free as much of the netting as possible and attach lifting bags which are inflated to lift the freed netting to the sea surface.

150. Once the netting is at the sea surface it will be lifted aboard the MS Tender using its crane system. Once on board it will be weighed (see section 3.10.2 for further detail) and then stored appropriately in the hold. Once all dives have been completed the MS Tender would return to Stellendam port where its cargo of marine debris would be passed to a waste management company for recycling or disposal at landfill. Salvaged fishing gear is put aside in big bags at the port of arrival and removed and recycled in accordance with the applicable rules.

3.4.4.2 Ensuring environmental impacts are minimised.

151. Many of the DDNSZ personnel are trained marine ecologists, who are undertaking this work as they have a desire to improve the quality of the marine environment.

152. As a priority, the divers will on first inspection at any dive site free any organisms which have been trapped within the nets and that are still alive. DDNSZ have over their previous campaigns freed 8,140 crabs, 720 lobsters and 412 fish from ghost fishing gear. If attempts to release an animal underwater fail, DDNZS will bring the animal (especially North Sea crabs) up from the seabed in the bags and release them on deck and then return them to the water. Fishing gear which has eggs attached to it (such as elasmobranch eggs which does occasionally occur) will be left in situ or at least the part of the item that supports the eggs will not be removed.

153. The method of using hand tools such as diving knives to painstakingly free netting from an obstacle is the least damaging method possible and raising the netting to the surface using lift bags will cause no additional impact to the benthic or marine environment.

154. DDNZS have permission from the relevant authorities in the Netherlands to undertake diving within all Natura 2000 sites. Before undertaking any operations notifications are provided. The captain of the vessel is provided with an updated map, so is aware of exactly where permission has been granted to dive.

155. The Norfolk Projects has been informed by DDNZS that they have acquired all the relevant agreements, licences and permits to undertake their debris removal operations. Further information is provided in Annex 2.

3.4.4.3 Ensuring impacts to heritage are minimised

156. DDNSZ divers commit to not moving or removing any items which may be considered of heritage value. They do however, commit to, photograph, measure and map heritage features and to report these to the Rijksdienst voor het cultureel Erfgoed (National Cultural Heritage Agency).

3.4.5 Mechanism for delivery

157. Should the BIMP be approved, The Norfolk Projects would provide funding which is equivalent to two marine debris removal campaigns in the southern North Sea. DDNSZ has confirmed their agreement with this, evidence of which is provided by their letter of intent in Annex 7 of this BIMP. The funding provided to DDNZS would cover all required planning for the campaigns, required training, the charter of the MS Tender, food and expenses for the divers and further funds for recycling or disposal of marine debris.

158. The funding provided by The Norfolk Projects also includes a budget for personnel to accurately report on the amount of marine debris which has been removed and record (see section 3.10.2 its nature, weight and the location from where it has been removed.

3.5 Removal from beaches in southeast England

159. Production of plastic waste is a continuously increasing problem across the globe. The threat this poses is recognised and is included in the Marine Strategy Framework directive (MSFD, Descriptor 10: Marine Litter; EUC, 2008, 2017) (transposed into UK law under the Marine Strategy Regulations 2010). Plastics in the marine environment break down into microplastics, which are a particular concern as these are frequently ingested by marine animals and cause harm to marine biota by physically hampering biological processes and by leaching toxic chemicals. Microplastics have now been identified in many areas of the marine environment, including shorelines, estuaries and the sea surface to the depths of the ocean. They have also been found within the bodies of marine organisms, from zooplankton to whales, where they pose mechanical hazards to respiratory organs and the circulatory systems (Knutsen *et al* 2020).

160. Microplastics also enter food chains relied upon by humans via the marine environment. Tissues of suspension feeding benthic species such as blue mussels were observed by Karlsson *et al.,* (2017) as containing microplastic levels which were approximately a factor 1000 higher than in sediment samples from the same region.

161. Microplastics were observed in samples of marine polychaetes in the central North Sea and the northern North Sea, and the concentrations of microplastics were significantly higher in the bodies of polychaetes than in sediment sampled from the same region, implying that polychaetes may favourably select certain microplastic particles as building materials for their tubes, instead of the naturally occurring materials such as sand grains or biogenic remains. Bue *et al* (2023) published a study quantifying microplastics in the bioconstructions of the tube dwelling *S. spinulosa* (a qualifying interest feature of the HHW SAC) in the Mediterranean and found that microplastic concentrations in the bioconstructions were almost double that of the surrounding sediment, and this paper proposed that accumulation may be more passive than active accumulation. Concentrations of microplastics were 6-11 times higher in the tubes than in the polychaetes themselves.

162. All of the above demonstrates the accumulation and negative effects of plastics within the marine environment including the organisms which make up the designated features of the HHW SAC. Therefore, it is important to locate this plastic and remove it in the most efficient way possible.

163. Attempts to understand cycling of marine plastics in the marine environment have been undertaken using modelling. Results from a model produced by van de Molen *et al.,* (2021) have indicated that floating plastics released into the North Sea can accumulate temporarily on salinity fronts and in gyres, and over time are deposited predominantly on west-facing beaches. Some modelling studies estimate that 66.8%

of positively buoyant marine plastic debris released into the ocean since 1950 is stored on coastlines (Lebreton *et al.* 2019).

164. Onink et al. (2021) have conducted more recent modelling, examining beaching and resuspension probabilities of marine plastics in the North Sea and results show it is likely that over 25% of positively buoyant marine plastic debris never travels beyond 50km from the coastline. At the end of 5 years of simulations, between 31% and 99% of this material is beached, depending on parameter values. This implies that intertidal and coastal zones are ideal targets for removing abundant marine plastic.

165. Negatively buoyant marine plastics in the Onink *et al.* (2021) study were modelled as moving slower and less far than floating plastics, accumulating in deeper areas of the North Sea, and deposited more on west- and north-facing beaches. This propensity of negatively buoyant marine plastic debris to be transported to deeper water is likely to have been a factor in the low abundance of marine debris targets observed in the marine debris areas of search in the HHW SAC, with currents moving debris to deeper water in the east and north of the windfarm array area. A review of Europe-wide beach litter has found abundances of several hundred pieces of litter items on beaches around the North Sea (Hanke et al., 2019). Over the five year study the spatial pattern in abundance of items largely showed little variation around the coasts of the North Sea (although there were relatively few sampled beaches along the UK east coast).

166. Consultation with Richard Thompson (OBE FRS and Professor of Marine Biology and Director of the Marine Institute at the University of Plymouth) has been undertaken by The Norfolk Projects. Professor Thompson suggested that "*measures to address marine litter, and associated funding, should be focused upstream of beaches and on prevention rather than remedy. In terms of any removal, hand picking of litter from shorelines is likely the most effective strategy from the perspectives of quantities removed, costs, associated environmental impacts and wider benefits including educational value. Any such efforts should target items which are large enough to be collected by hand before they break down into micro- and nano-plastics*" (Professor Richard Thompson pers. comm. 2024).

167. Furthermore, as mentioned in section 3.2, Hornsea Project Three's marine debris removal report made recommendations that future benthic compensation packages could include activities such as beach cleans.

168. In light of Professor Thompson's suggestion and the recommendation made in Hornsea Projects Three's report, engagement has been undertaken with prominent UK beach clean groups to explore potential collaboration. Further detail on this is outlined in Annex 2, Benthic Compensation Consultation Report.

169. Two beach clean groups have agreed to collaborate with The Norfolk Projects and remove debris from the beaches along the south coast of England. Firstly, Norfolk Beach Cleans (NBC), and second Keep Britain Tidy (KBT).

170. Both organisations have a proven track record of removing beach litter debris from the southeast coastline of England during recent years, with KBT's BeachCare campaign dating back to 2010. Since inception, with the support of 2,085 volunteers, NBC have removed 3,340kg of beach litter. Another example is KBT's removal of 2,500kg of beach litter from the coastline in 2023. Both organisations have the methodologies, data gathering capacity and volunteer networks required to support The Norfolk Projects' campaign to remove beach debris.

171. The remainder of this section (section 3.5) provides details of the work that will be undertaken by NBC and KBT (subject to timely approval of the BIMP). As evidence that NBC and KBT are in agreement with this proposal, signed letters of intent are presented in Annex 8 and Annex 9.

3.5.1 Target criteria

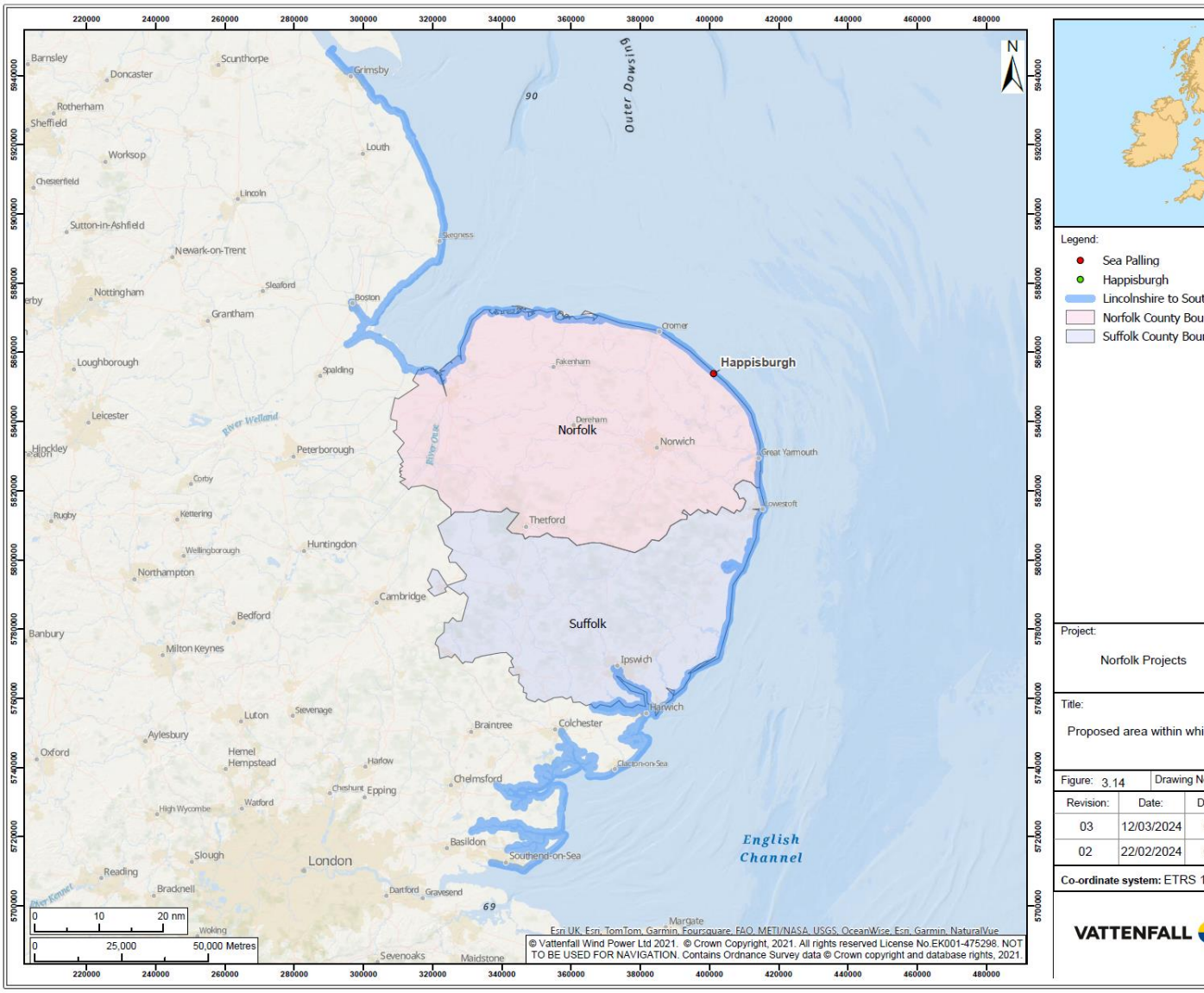
172. For this work stream The Norfolk Projects will target any anthropogenic beach debris along the coastline of southeast England. The beach debris will be visible to the human eye and light enough for a beach clean volunteer to collect.

3.5.2 Identifying areas of search

173. NBC are a community interest social enterprise, established in 2021 that run beach clean operations across four different locations in Norfolk including: Caister; Scratby; Great Yarmouth and Gorleston. In 2024 NBC would, with the funding from The Norfolk Projects, increase their geographical scope with the addition of four further beach clean sites: Heacham; Wells-next-the-Sea; Holkham and Brancaster. In total, NBC aim to undertake 58 beach cleans in 2024. They have used data from previous beach cleans to estimate that the average weight of litter collected per beach clean will be 28kg.

KBT are a much larger organisation than NBC and with funding from The Norfolk Projects, would undertake up to 200 beach clean events at locations along the Lincolnshire, Norfolk, Suffolk and Essex coastline. Using data from previous beach cleans it is estimated that an average weight of

litter collected per beach clean would be 12.5kg.



174. Figure 3.14 below outlines the geographical extent of the areas of search for this work stream of the BIMP.

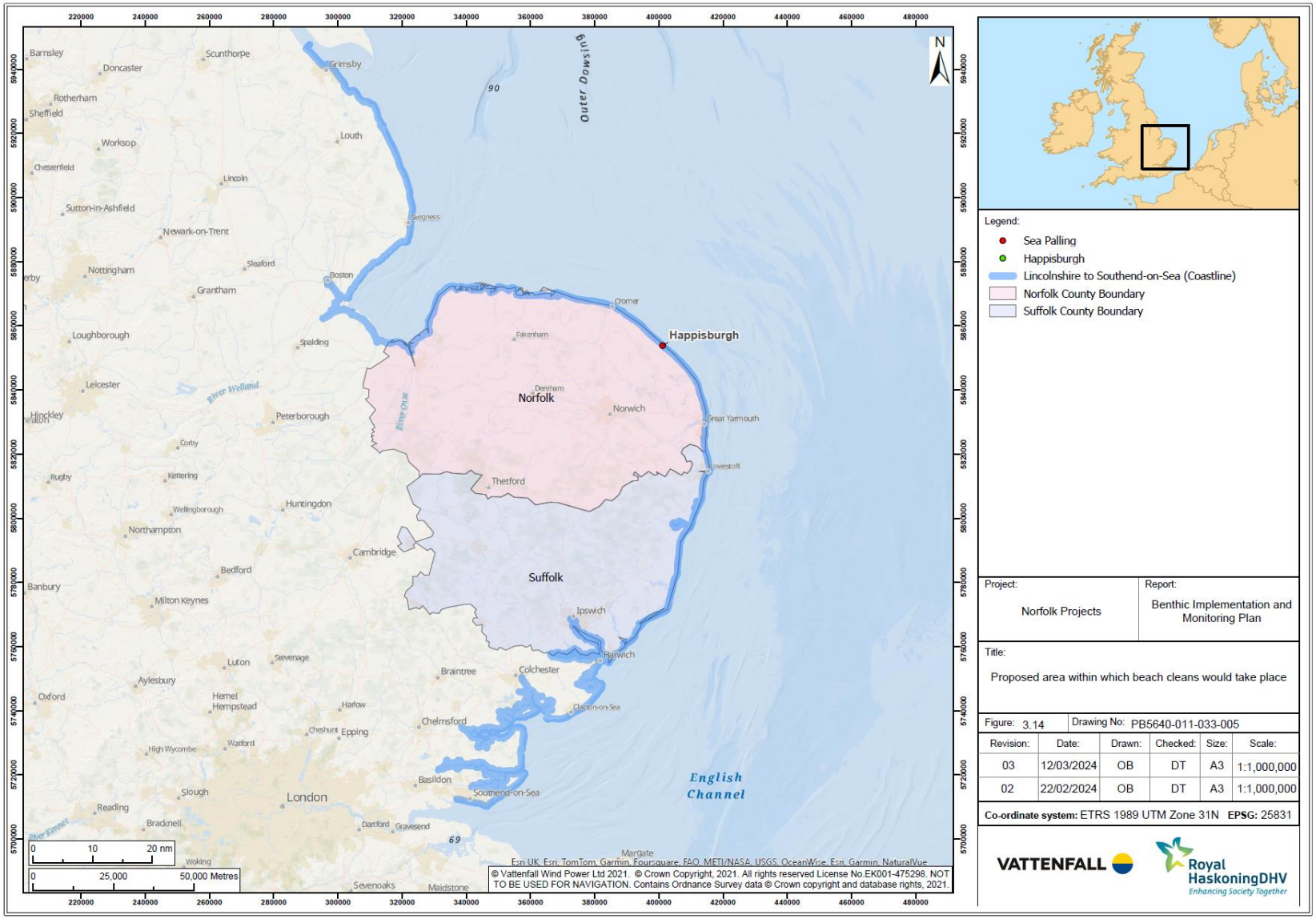


Figure 3.14 Map showing the proposed locations for beach cleans.

3.5.3 Details of the location, nature and size of debris

175. In discussion with NBC and KBT, The Norfolk Projects has estimated the quantum of beach litter that is likely to be removed in the 2024 campaigns. NBC data shows that in Norfolk alone, 23 beach cleans, with 481 members of the public volunteering, resulted in the removal of approximately 744kg of beach debris. In 2022 this figure increased to 48 beach cleans, with 804 members of the public volunteering, resulting in the removal of approximately 1,061kg of beach debris. Last year in 2023, the NBC capacity continued to increase with 47 beach clean events and 727 members of the public volunteering, resulting in approximately 1,423kg of beach debris being removed, Therefore, it is estimated that with the funding from The Norfolk Projects at least 1,624kg of debris would be removed by NBC in 2024.

176. In order to demonstrate how this will contribute towards the 10.7ha target required by the Benthic Compensation Schedules, a conversion rate between the unit of weight that NBC and KBT use to measure the amount of material retrieved (kg) and the area that that material could impact on the seabed (m^2) has been established.

177. Data from NBC shows that a significant proportion of material gathered can be categorised as wet wipes, plastic bottles, aluminium cans, fishing gear, and food packaging – see Figure 3.15 for some pictures of these commonly collected items. Plastic crates, lobster pots, and glass bottles are also likely to contribute to the total weight of beach litter recorded during a beach clean event.

Figure 3.15 Photographs taken by NBC of beach litter after removal and sorting.

178. The Norfolk Projects has used these items to calculate a conversion factor. An average weight, length, and width value for these commonly collected items have been used to set a mean area of **2.37**m^2 per kg of beach litter collected. The data that informed this conversion rate is presented in Table 3.5 below.

179. It is predicted that 1,624kg will be collected by NBC and 2,500kg by KBT. Using the conversion rate outlined above, a total of 4,124kg of beach debris would equate to a total area of 9,774m^2 (0.98ha) which is 9.1% of the 10.7ha benthic compensation requirement.

180. NBC and KBT both believe that these predictions are reasonable and that their organisations will likely remove a weight of beach debris that exceeds this.

Table 3.5:Calculations of area of effect.

Item	Weight (g)	Length (cm)	Width (cm)	Area (m^2)	m^2 per kg (to 2 decimal places)	kg required to reach 107,000m^2
Wet Wipe	6.7	27	20	0.05	8.06	13,263
1.2 Lire Plastic Bottle	35	33	12	0.04	1.13	94,571
Aluminium drink can	13.4	16.8	6.6	0.01	0.83	129,311
Glass Bottle	419	19	6.8	0.01	0.03	3,470,046
Crisp Packet	3	19.4	13.3	0.03	8.67	12,441
Plastic Crate	920	60	40	0.24	0.26	410,167
Lobster Pot	22,000	66	61	0.40	0.02	5,847,287
Tyre	7,000	N.a. due to tyre geometry	55 (diameter)	0.24	0.03	3,152,583
Average	**3,800**	**34**	**23**	**0.13**	**2.37**	**1,641,210**

3.5.4 Method statement for removal

181. Both NBC and KBT have formalised beach clean methodologies with all the relevant skills required to ensure that beach clean related risks are well managed and the event runs safely. With funding provided by The Norfolk Projects, further equipment would be purchased to ensure that future beach clean events are safer and more efficient.

182. A beach clean leader from the organisation will undertake a risk assessment of the site to ensure that key risks have been identified.

183. The beach clean leader will then lead the group through the following brief:

- Identify the survey area.
- Explain that the aim is to collect and survey every piece of litter in that section but that volunteers must not touch anything that looks like it might be dangerous or too heavy.
- Stress that volunteers are only collecting man-made items, not natural debris, like seaweed or driftwood twigs.
- Explain that sharp items must not be disposed of in bin bags as they can rip the bags and cause injury. Glass and other sharp pieces of debris must be disposed of in a designated box.
- Point out any other hazards identified in the risk assessment.
- Ensure that groups have all the correct personal protective equipment (e.g. gloves and litter pickers).
- Ensure that each group has an adult among them to supervise. Beach clean leaders will patrol all groups and identify any safety risks both to health and to the environment.

184. After the beach clean event is complete, the weight of the litter bags would be recorded along with an approximation of the percentage breakdown of the types of litter gathered.

185. Beach debris will be disposed of through a recycling end of life pathway where possible, or otherwise delivered to a general waste skip.

3.5.4.1 Ensuring Environmental Impacts are minimised.

186. The Norfolk Projects has been informed by KBT and NBC that they have acquired all the relevant agreements, licences and permits to access and undertake beach cleans along the coastline of southeast England. Further information is provided in Annex 2.

187. The beach clean lead will deliver a brief to highlight any sensitive features within the beach clean area of search prior to the start of the clean.

3.6 Marine debris removal from the sea surface

188. As described above at the beginning of section 3.5, there is a rapidly growing body of evidence to show that plastics in the marine environment can have an extremely detrimental effect on the biology of marine organisms and at an ecosystem function level. Any plastic entering the marine environment could either have direct effects on the marine environment through effects such as ghost fishing by fishing nets made of plastic or via the breakdown of the macro plastics into micro plastics.

189. Plastic debris is of particular concern due to its abundance, and its persistence in the environment, which makes it a ubiquitous category of marine debris (Gall and Thompson 2015). Global production of plastics has increased considerably over the last few decades from 5 million tonnes per year in the 1960s to 280 million tonnes per year in 2011 (PlasticsEurope, 2012). The absolute quantity of plastic debris that enters the marine environment is, however, unknown.

190. Once broken down into microplastics it is almost impossible to remove from the ecosystem and therefore plastic removal on a vast scale is required as soon as possible to be able to prevent extreme and widespread harm to all marine ecosystems.

191. Furthermore, as mentioned in section 3.2 Hornsea Project Three's report on debris removal recommended that activities such as, removal of floating debris, could be included in benthic compensation proposals.

192. In light of the above, The Norfolk Projects has proposed a collaboration with The Ocean Cleanup to remove plastic from the sea surface. This would, along with the other four work streams, contribute towards the 10.7ha requirements of the Benthic Compensation Schedules and would likely exceed them, as well as bringing additional environmental benefits.

193. The Ocean Cleanup have an aspiration of ridding the oceans of marine plastic before 2040 as they have calculated that plastic in the marine environment today will have broken down into microplastics within twenty years and beyond that date the damage to marine ecosystems from plastic and micro plastics will be irreparable.

194. Beligno *et al.,* 2021 found that when considering functional traits of aquatic benthic organisms at a global-scale, traits with possible effects at population level appear to be negatively affected by microplastics. And that the direct impact of organismal performance may have indirect repercussions at higher levels in the ecological hierarchy and represent a risk for the stability and functioning of the ecosystem.

195. Most relevant to benthic compensation, Knutsen *et al* 2020 identified large quantities of micro plastics within polychaete worms (the group in which Sabellaria

belong) and as discussed in section 3.5 micro plastics have been found in high quantities in *Sabellaria spinulosa* for which the HHW SAC is designated (albeit only once forming a reef). Therefore, although it is not possible to trace all plastics on their journey from land, through their breakup into microplastics and their subsequent buildup in organisms, it is known this is occurring.

3.6.1 Target criteria

196. For this work stream The Norfolk Projects will be targeting the collection of surface-dwelling marine plastic.

3.6.2 Identifying areas of search

197. Research dating back to the 1970s indicated that marine debris was accumulating in the North Pacific. From 2018 onwards, The Ocean Cleanup has used advanced modelling techniques to identify the highest areas of marine debris within the world's oceans and therefore know where to target removal, achieving the most benefit. The best and most efficient way of removing marine plastic is currently removal at the sea surface.

198. The Ocean Cleanup have stated that their models and data analysis show that there is not enough floating plastic within the North Sea to make a clean up operation in that area effective. They did undertake validation trials for their technology in the North Sea and although these were a success, they did not remove anywhere near the quantities of debris that can be achieved in other marine areas. The Ocean Cleanup have however identified that the area with the highest concentration of marine debris is in the North Pacific.

3.6.3 Surveys of the area

199. In 2015 The Ocean Cleanup undertook an extensive survey of the North Pacific using 30 vessels to sample the area for plastics. This survey provided real life data which supported the theory that plastic was building up in this area.

200. In 2022 and 2023, The Ocean Cleanup undertook a number of very successful technology validation campaigns in the North Pacific, during which more than 153 tonnes of plastic were collected. Therefore, in this area no further surveys are required in order to proceed to the removal stage.

201. The Ocean Cleanup has stated that the North Pacific is where efforts are best focused for the next few years in order to achieve the greatest volume of material removed and therefore there is currently little scope of debris removal in other locations during 2024 and 2025 (The Ocean Cleanup Pers. comm. 2024). The Ocean Cleanup do have aspirations to expand operations into the Atlantic and feasibly to the North Sea once the clean up in the Pacific has been completed. By funding The

Ocean Cleanup's campaigns in the North Pacific, The Norfolk Projects will be accelerating and facilitating this expansion.

202. The remainder of this section (section 3.6) provides details of the work that will be undertaken by The Ocean Cleanup (subject to timely approval of the BIMP). As evidence that The Ocean Cleanup are in agreement with this, a signed letter of intent is presented in Annex 10.

3.6.4 Details of the location, nature and size of debris

203. Located in the Pacific is one of the largest oceanic gyres on earth. An oceanic gyre is where water currents circulate and, in this location, the circulating currents trap floating material such as plastic. There is so much plastic trapped in this gyre that the area has been named the Great Pacific Garbage Patch or GPGP.

204. The GPGP covers a large area (around 1.6million km^2). That is only 0.5% of the world's ocean surface but it is estimated to contain more than 50% of all the plastic mass floating in the open oceans. Through survey data collection and modelling it has been shown that the GPGP contains about 100,000,000kg of plastic made up of approximately 1.8tn plastic pieces. That is equivalent to 250 pieces of plastic for every human on the planet.

205. Within the GPGP are vast debris fields with concentrations averaging tens to hundreds of kilograms of plastic per square kilometre. In order to resolve this accumulation, there is a need to not only stop more plastic from flowing into the ocean, but also to clean up the legacy plastic already there. Floating plastics trapped in the patches will keep circulating until they break down into smaller pieces and microplastics, becoming harder or even impossible to clean up. If left uncleaned, the plastic will impact our ecosystems (in the ways explained in section 3.5), health, and economies for decades or even centuries to come.

206. The first measurements of plastic in the GPGP date from the 1970s, and subsequent calculations indicate that plastic and microplastic mass concentrations are increasing exponentially. The mass concentration levels gradually decrease toward the outer boundaries of the GPGP. The concentration levels in the centre can reach hundreds of kilograms per square kilometre and decrease to 1 kg/km^2 in the outermost region. The high density of plastic also manifests in localised 'hotspots': areas just tens of kilometres across, with exceptionally high densities of plastic. Hotspots appear and disappear throughout the patch, caused by local currents converging (creating a hotspot) or diverging (creating an empty area). The Ocean Cleanup discovered this phenomenon through a combination of measurements and modelling.

207. It is therefore challenging to say exactly where the plastics will be in 2024 and 2025 however The Ocean Cleanup campaigns are informed by live data and analysis

passed on to the vessels by the modelling teams. On average, the GPGP orbits around a point located at 32°N and 145°W. However, the modelling team has observed seasonal shifts from west to east and substantial variations in latitude (north to south), depending on the year. Figure 3.16 shows a map with of its location between California and Hawaii.

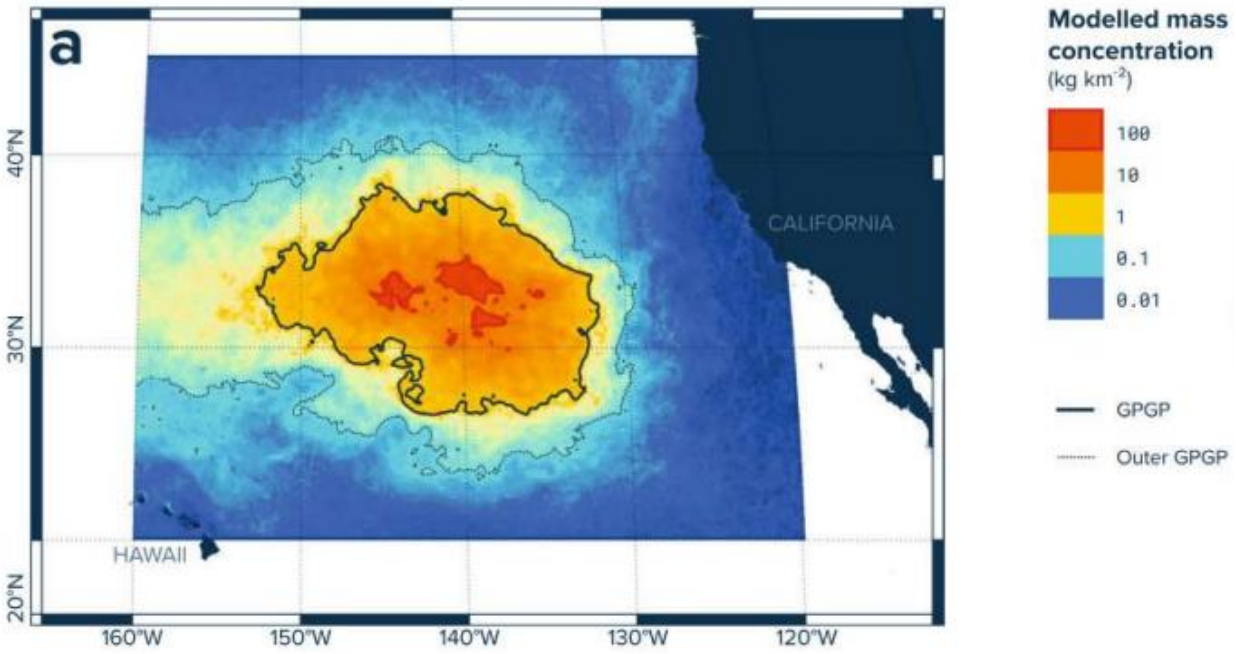


Figure 3.16 Map showing the location of the Great Pacific Garbage Patch created by modelling concentrations of Plastic. Figure provided by The Ocean Cleanup.

208. The nature of the materials that accumulate within the GPGP mostly consist of high-density polyethylene (HDPE) and polypropylene (PP) as these both have a lower density than seawater and thus float, but choppy conditions are known to push debris under the surface. Based on vertical distribution measurements, The Ocean Cleanup have found that most plastics remain in the top few meters of the water column. Further information on the type of items collected is provided below in section 3.6.4.1.

209. The minimum diameter in the nets used to collect the plastic by The Ocean Cleanup is 2cm by 2cm. However, once plastics have fragmented into microplastics, they can lose their buoyancy and spread throughout the water column, as The Ocean Cleanup demonstrated in a 2020 study (The Ocean Cleanup 2020). This is irreversible and causes the plastic to interact with many more species, making it crucial to remove before further fragmentation occurs.

3.6.4.1 Likely quantities and conversion to area impacted

210. The Ocean Cleanup's reporting systems are based on a measurement of the debris weight. Therefore, it is necessary to use a calculation to convert the weight of

marine debris that The Ocean Cleanup will retrieve to an "area" for the purposes of establishing whether the requirements under the DCOs have been discharged.

211. Data collected during The Ocean Cleanup validation campaigns in the Pacific in 2022 and 2023 showed that 60% of the material removed was fishing nets and that the other 40% was made up of other floating objects including fishing related gears such as buoys, ropes and floats etc as well as barrels and crates. Fishing equipment, especially nets of the type which are likely to float have the potential to affect a large area if spread out (see Figure 3.17). The other items identified do not have the same potential to impact a large area although would still contribute towards the totals required by the DCOs.

Figure 3.17 photograph of a net being retrieved and photograph of a net spread out to show the maximum area that it could affect at any point in time.

212. Other retrieved items that were found within The Ocean Cleanup catches include crates and plastic barrels. For the purposes of conversion, these are classified as "other plastics".

213. Using this information and by conducting a search of the average dimensions and weight of these types of objects, an area in metres squared per kilogram (m^2/kg) of weight can be calculated. When estimating this value for fishing nets, five examples of lightweight nets of the type which are most likely to remain floating and therefore captured in The Ocean Cleanup's catch have been used to calculate the mean value for the conversion factor.

214. As shown in Table 3.6 the metre squared value per kilogram for nets has been calculated as **30.525** (i.e., for every kilogram of net retrieved this would contribute approximately 30.525m^2 towards the debris removal area). It should be noted this is

a different conversion factor to that used for the Ghost Fishing UK or for DDNZS hauls. The difference is mainly due to debris being removed from different locations (both geographically and in the water column) and by different methods of retrieval. Appendix 11 details how the area for nets has been calculated.

215. The metre squared value per kilogram for other plastic is **0.102** (i.e., for every kilogram of other plastic retrieved this would contribute 0.102m^2 towards the debris removal area).

216. Using these conversion rates, The Norfolk Projects can demonstrate that approximately 3,505kg worth of net would need to be recovered to meet the 10.7ha target (in a scenario where fishing net was the only type of debris recovered). Conversely, approximately 727,544kg worth of "other plastics" would need to be recovered to reach the 10.7ha target in a scenario where it was just other plastics that were recovered.

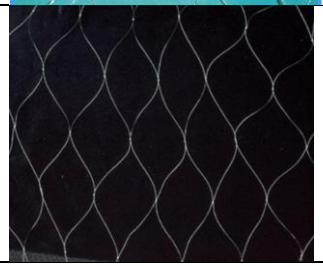
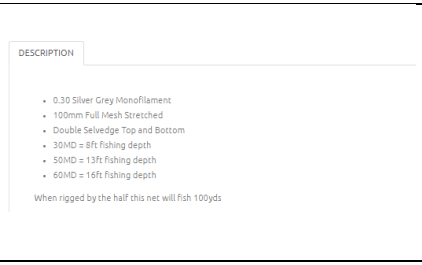
217. Given that 60% of the catch is likely to be fishing net, the conversion factors can be applied to an equivalent ratio. For example, if 39,725kg was recovered, approximately 23,835kg of this is likely to be nets. These nets would have the potential to impact an area of approximately 727,647m^2 (based on the average fishing net from Table 3.6. equating to 30.527m^2 (rounded to 3 decimal places) per kilogram). If 15,890kg (the remaining 40%) removed was "other plastics" this is likely to equate to a further 1,672m^2 of impact area (based on the average from Table 3.6 equating to 0.102m^2 (rounded to 3 decimal places) per kilogram calculation).

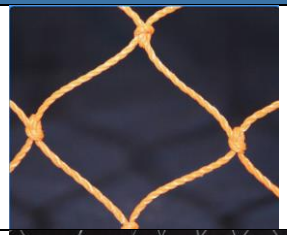
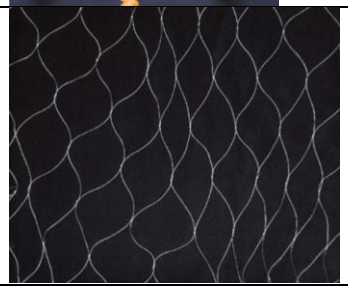
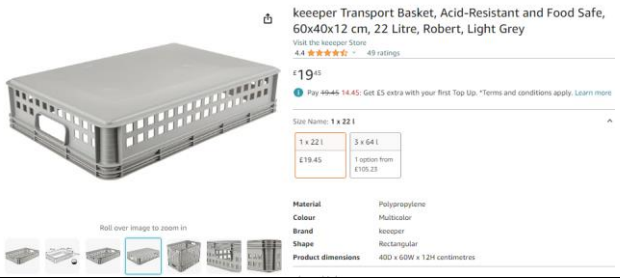
218. Therefore, from a 39,725kg haul of plastic a total impact area of 729,275m^2 could be derived. This is 72.9 hectares and would therefore allow The Norfolk Projects to demonstrate that it had exceeded the 10.7 hectares requirement.

219. However, given that there are many assumptions being used in the calculations it is considered that the significant exceedance and over delivery account for any uncertainty associated with those assumptions.

220. The Ocean Cleanup has been consulted on these conversion factors and are content that they are based on reasonable assumptions which reflect the reality of their operations in the North Pacific.

Table 3.6 Calculations of the area of effect.

Item	Details	Weight (kg)	Length (m)	Width(m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
Twisted HDPE Trawl Netting	 	5.12	10.25	8.2	84.05	16.416	6,518
3mm Braided Ocean Compact Netting	 	7.6	91.44	3.048	278.7	36.672	2,918
0.30 X 100MM (4 inch) Bass/Mullet Net	 	7.2	91.44	4.87	445.31	61.849	1,730

Item	Details	Weight (kg)	Length (m)	Width(m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
10/39 (2.3MM) 82MM INSIDE MESH ORANGE	 DESCRIPTION 10/39 (2.3mm) Orange Twisted PE Trawl Netting 125 Mesh Wide x 100 Mesh Deep 80mm inside mesh **Bale Size/Weights** 125ML X 100MD/7.5KG 250ML X 100MD/15KG 500ML X 100MD/30KG 1000ML X 100MD/60KG	7.5	10.25	8.2	84.05	11.207	9,548
0.40 X 125MM (5 INCH) X 30MD X 1440ML Cod net	 0.40 X 125MM (5 INCH) X 30MD X 1440ML WHEN RIGGED THIS NET WILL FISH 10 FT DEEP AND 80 YDS LONG.	11.57	73.152	9.144	668.9	57.813	1,851
					Average net	**30.527m^2**	**4,513kg**
Crates	 keeeper Transport Basket, Acid-Resistant and Food Safe, 60x40x12 cm, 22 Litre, Robert, Light Grey £19.45 Material Polypropylene Colour Multicolor Brand keeeper Shape Rectangular Product dimensions 40D x 60W x 12H centimetres	0.92	0.6	0.4	0.24	0.261	410,167

Item	Details		Weight (kg)	Length (m)	Width(m)	Area (m^2)	m^2 per kg (to 3 decimal places)	Weight required to reach 107,000m^2 (kg)
Barrel		Specifications Lid included: Lid included Stand included: Stand included Product weight: 3kg Material: Plastic Product height: 960mm Colour: Black Product diameter: 360mm Product width: 320mm Assembly required: Partial assembly Product code: 2400005919242	3	0.3	0.96	0.31	0.102	1,044,922
						Average of other plastics	**0.102m^2**	**727,544 kg**

3.6.5 Method statement for removal

3.6.5.1 Vessel types and tools to be used

221. Weather prediction programs are used in combination with The Ocean Cleanup's own oceanography data model that predicts where the most plastic can be found. Combining these two inputs allows an optimised positioning strategy for the vessels to ensure that the system is located within a plastic hotspot. By maintaining a relative speed difference to the plastic, The Ocean Cleanup collect the plastic in their novel Retention System.

222. The Ocean Cleanup's Retention Systems utilise the 'active propulsion' of the water column and a screen made of a 16mm mesh net with two types of fenders (550mm and 800mm) referred to as "a wing module". The wing module is towed by two T-class vessels (T- Class Vessels have been designed to trawl cables and other heavy equipment through the sea). This wing module penetrates the sea surface to a depth of 4m and reaches a span of 2,500m to gather marine debris as it is towed along the sea surface. As the vessels progress, marine debris is gathered by the wing modules and funnelled towards the "Retention Zone" which has been designed to be easily emptied onto a vessel when full. Figure 3.18 shows a rendered aerial image of system 03 (also known as Josh – after the Tom Hanks character from the film BIG) which will be used for The Ocean Cleanup marine debris removal campaign alongside the smaller system 02 (also known as Jenny - after the love interest of Tom Hanks's character Forrest from the film Forrest Gump) which was retired in 2023.

223. The vessels used are in a category known as Anchor Handling Tug Supply (AHTS), a type of multipurpose vessel such as the Maersk Tender which is shown in Figure 3.19. The Maersk Tender is 73.2 metres in length and 20m in width with a draught of 7.7m. Her back deck has an area of 600m^2 and a cargo capacity of over 1,000 tones. The vessels adjust and maintain the "wingspan", speed, and direction for maximum efficiency.

224. Once the system is full of plastic, the Retention Zone is bought aboard one of the vessels and sealed. The retention zone bag is then detached from the hauling system and emptied onto the vessel rear deck where the debris is sorted for its ongoing processing once on land. Figure 3.20 shows the plastic being sorted into containers on the rear deck.

225. Once empty the Retention Zone is put back in place in the ocean and the cleanup continues. Once the onboard containers are full of plastic, the ships return to shore for recycling. The Ocean Cleanup are developing numerous recycling pathways for the retrieved plastic many of which are set up to help fund the continued cleanup campaigns.

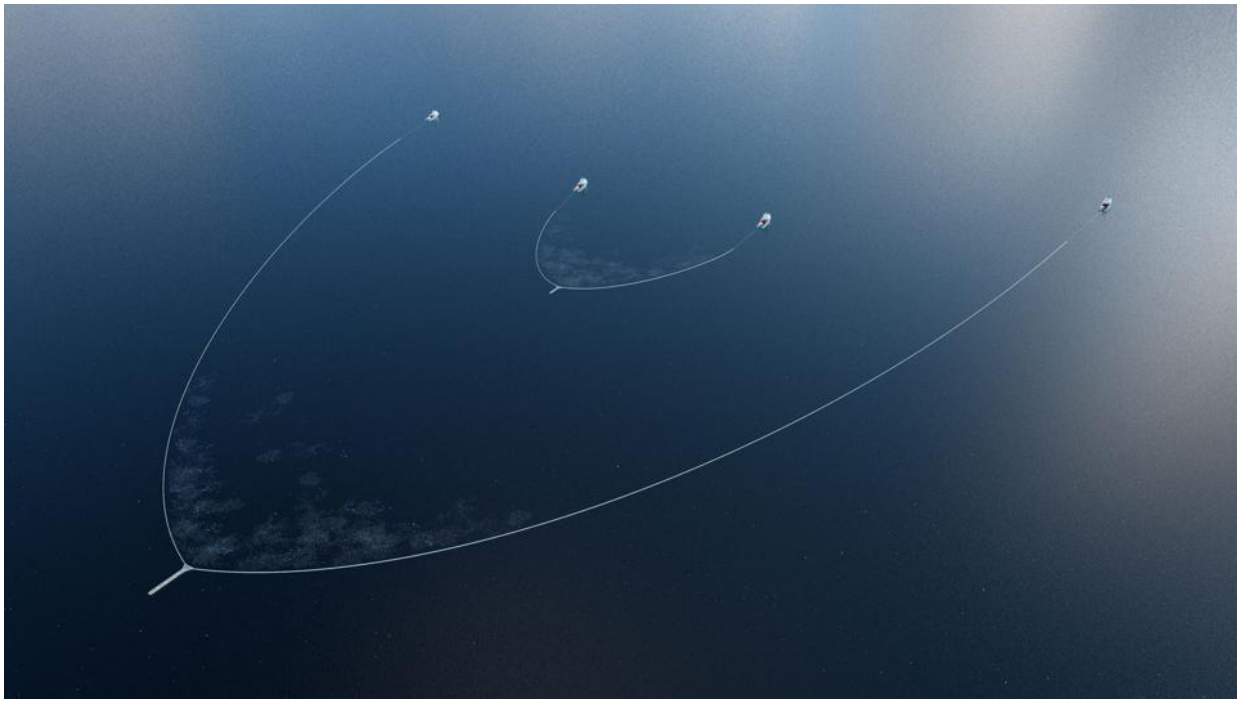


Figure 3.18 A rendering of System 03 compared with System 02. System 03 is three times the size of System 002. The Ocean Cleanup

Figure 3.19 The Maersk Tender, one of the vessels used by The Ocean Cleanup to tow system 03 in the North Pacific

226. In collaboration with The Norfolk Projects and as result of the funding which will be provided (subject to timely approval of the BIMP), The Ocean Cleanup has planned 3 trips in the GPGP in 2024 (they are due to undertake a further 3 trips which are funded by other means however with The Norfolk Projects funding, they will double their efforts). These 3 trips will result in the removal of, at a minimum, 39,725kg (put probably significantly more) of ocean plastics. The planned dates for these campaigns are as follows:

- Trip 21 - 5 June 2024 to 24 July 2024
- Trip 22 - 24 July 2024 to 11 September 2024
- Trip 23 - 11 September 2024 to 30 October 2024

Figure 3.20 A screen shot from a video showing a haul from System 03 being sorted on the back deck of one of the vessels. The Ocean Cleanup

3.6.5.2 Ensuring Environmental Impacts are minimised.

227. The Ocean Cleanup constantly carry out assessment of the environmental impacts of their operations and as a result have implemented effective mitigation measures.

228. The Norfolk Projects has been informed by The Ocean Cleanup that it has acquired all the relevant agreements, licences and permits to undertake operation of debris removal from the sea surface in the international waters of the Pacific Ocean. Further detail is provided in Annex 2.

229. The Ocean Cleanup's motivation behind its mission to rid the world's oceans of plastic is to make the ocean a healthier place for all life that benefits from it. The

systems are all designed to be safe for the environment and any possible impacts are mitigated by:

- The very slow speed at which the vessels travel (generally 1.5 knots or just less than 3km/h, which is slower than a casual stroll), which allows any mobile organisms to evade the system or if they do get trapped within the wings means they will not suffer harm.
- The material used to create the wings and retention zone, which are constructed from inert composites that will not degrade; .and
- The shape of the system has been chosen to limit the chance of animals being caught within it. For example, the shape of the wings allows organisms to swim underneath them.

230. As an extra precaution the system also features mitigation measures, explained below, to deter marine animals from approaching or interacting with it. All trips employ an environmental officer who monitors any interactions with marine organisms, this data is fed back into the system design and is also used to make on board adjustments. For example, if whales are spotted close to the system it will pause operations until the whales have passed by. The latest mitigation measure which has been deployed on System 3 is a “Marine Animal Safety Hatch” that has been added to the retention zone. The hatch can be opened to release animals within the retention zone if required. The system has cameras in the Retention Zone where the plastics accumulate which are monitored constantly to detect when marine life is entering. Marine biologists and environmental specialist(s) are present on board to ensure that the correct actions are taken if an animal enters the system or becomes trapped. If necessary, the entire catch can be released to allow an animal to escape.

3.6.6 Mechanism for delivery

231. The Norfolk Projects proposes to fund The Ocean Cleanup operations to remove nearly 40,000kg of marine debris. The Ocean Cleanup have accepted this by way of a letter of intent (provided in Annex 10).

3.7 Programme of works

232. In order to deliver the removal of 10.7ha 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 has been proposed. As discussed in section 3.2 it is highly unlikely that the debris removal campaign in the HHW SAC will result in 10.7ha of marine debris being removed and therefore the success criteria (explained in section 3.8) will not have been met through that element alone. Therefore, four other work streams are proposed to increase the likelihood of the 10.7ha requirement being met (and exceeded) during 2024. Subject to timely approval of the BIMP, all five work streams would commence as soon as practicable, which could mean commencement of the work streams by the start of May 2024, if not before. The Norfolk Projects has, at its own risk, already provided funding for some work streams in order to secure that works start as early as possible and can be completed prior to cable installation.

233. It is anticipated that through a combination of the five work streams the success criteria will be met; by including five different work streams there is also resilience to allow for one or more of the work streams to under-deliver. Based on the programme of works proposed, it would be known whether the success criteria can be met during 2024, so that adaptive management (described in section 3.9) could be deployed during 2025 if required.

234. The programme of works for delivery of the benthic compensation as well as adaptive management (if required) is presented in Figure 3.21 below. Also shown in the figure is the expected programme of work for any adaptive management required should export cable installation cause greater impacts than anticipated, as stated within the HRAs (Norfolk Vanguard Limited 2018b; Norfolk Boreas Limited 2019b) and Environmental Statements (Norfolk Vanguard Limited 2018a; Norfolk Boreas Limited 2019a) .

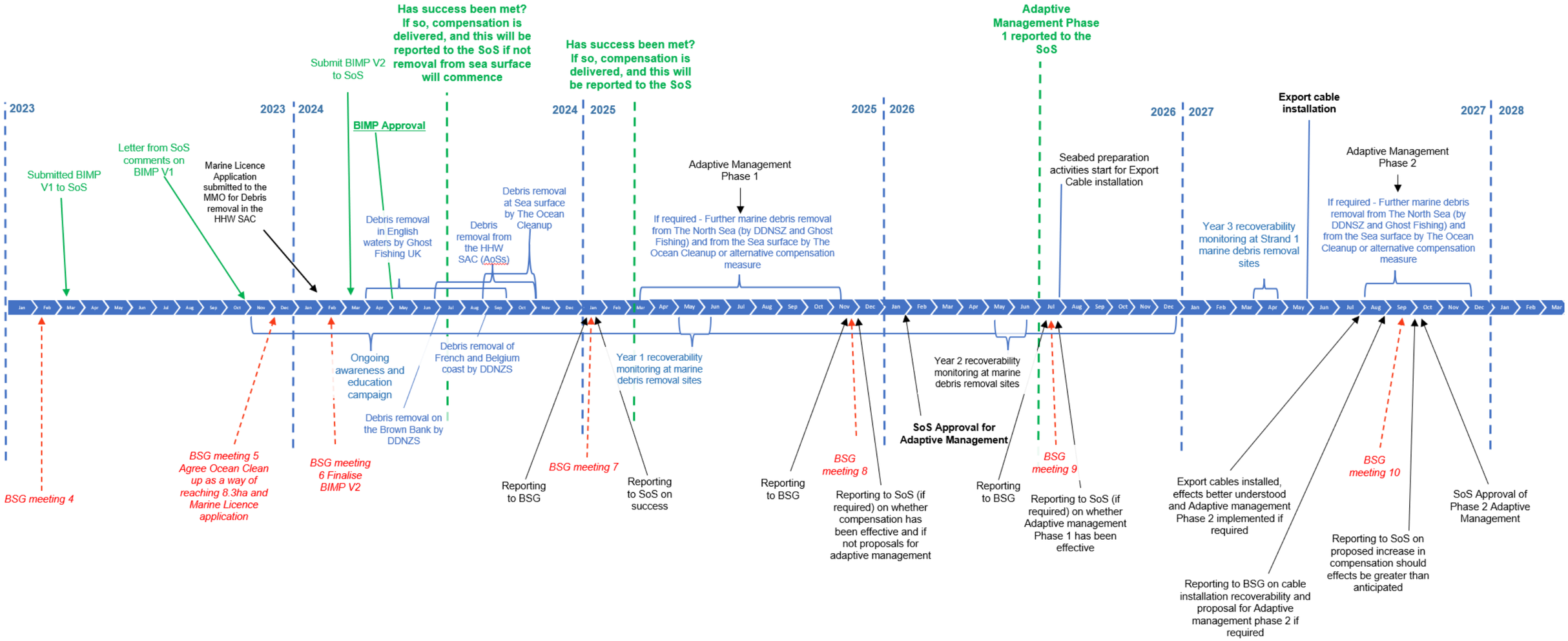


Figure 3.21 Programme of works for delivering benthic compensation (including adaptive management described in section 3.9 and the Marine Education and Awareness campaign described in section 4)

3.8 Success criteria

235. The Norfolk Boreas and Norfolk Vanguard Habitats Regulations Assessment (HRA) concluded that "*the maximum area of reef that would be lost to the Project in combination with Norfolk Boreas offshore wind farm would be 0.004% of the SAC area (or 5.9 ha)"* (the underlining has been added by the author) and that the maximum areas lost to permanent infrastructure of cable protection by each project would be 2.4 ha. Therefore, (as 2.4 + 2.4 + 5.9 = 10.7) a combined total of 10.7ha would need to be compensated for (see Annex 12 for further detail).

236. Therefore, success will be measured by The Norfolk Projects' ability to remove 10.7ha of marine debris. It is the combined total across all five work streams which is important, but for each work stream the following calculations will apply:

- For the removal of debris from the HHW SAC, by measuring the footprint that each piece of marine debris occupied on the seabed before it was removed and combining these measurements.
- For the removal of marine debris from English waters by Ghost Fishing UK, the conversion for weight to area impacted described in section 3.3.3.1 will be used to define how much of the 10.7ha requirement has been realised. It is anticipated that it will be 2.8 ha, however this will only be known once the campaign has been completed, the weight of removed debris reported, and the conversion calculations undertaken.
- For the removal of marine debris from the Brown Bank and French and Belgium waters by DDNZS, the conversion for weight to area impacted described in section 3.4.3.1 will be used to define how much of the 10.7ha requirement has been realised. It is anticipated that it will be 5.75ha, however this will only be known once the campaign has been completed, the weight of removed debris reported, and the conversion calculations undertaken.
- For the removal of marine debris from beaches in southeast England by Norfolk Beach Cleans and Keep Britain Tidy, the conversion for weight to area impacted described in section 3.5.3 will be used to define how much of the 10.7ha requirement has been realised. It is anticipated that it will be 0.98ha, however this will only be known once the beach cleans have been completed, the weight of removed debris reported, and the conversion calculations undertaken.
- For the removal of marine debris from the sea surface by The Ocean Cleanup, the conversion for weight to area impacted described in section 3.6.4.1 will be used to define how much of the 10.7ha requirement has been realised. It is anticipated that it will be 72.9ha, however this will only be known once the campaign has been completed, the weight of removed debris reported, and the conversion calculations undertaken.

237. Should reporting from the first four work streams indicate that they will exceed expectations and alone be able to meet the success criteria, The Ocean Cleanup removal would not be relied upon to discharge the condition (however, given that agreements with The Ocean Cleanup would be at an advanced stage at this point, The Norfolk Projects would honour any commitments on funding). It is considered unlikely that the four work streams alone would be sufficient to discharge the condition and, if this is the case, the combined area resulting from the completion of all five work streams will be calculated to provide the overall total which must equal or exceed 10.7ha for the success criteria to be met.

238. It should be noted that marine debris, depending on its nature, will also have an area of influence greater than its immediate footprint, for example a scour pit could form around the material, or if mobile, an area of disturbance could be created by the object moving around on the seabed. Therefore, by using the methods proposed above it could be concluded that The Norfolk Projects will be overcompensating by calculating only the area of seabed the object could occupy.

239. The success criteria described above will need to be met for the overall success of strand 1 to have been achieved and this criteria will be reported within the monitoring reports detailed under section 3.10. If the five work streams combined do not yield sufficient debris, then there will be a requirement for adaptive management to be implemented which is described in section 3.9.

3.9 Adaptive management

240. There are two triggers which would lead to adaptive management being required which are:

- Trigger 1: the combination of the five work streams discussed above, following the conversion of weight to area, result in less than 10.7ha of marine debris being removed; and
- Trigger 2: greater effects of cable installation and cable protection are realised than were assessed in the development consent application.

241. This section outlines the adaptive management measures that have been established to satisfy the discharge of the Benthic Compensation Schedules underpinning Strand 1 of this BIMP in the event that either (or both) of the triggers set out above occur.

242. See Figure 3.22 for an overview of the adaptive management process, which would be delivered, should the success criteria not be met, in one, or two phases depending on the stage at which the success criteria are considered.

243. Based on the estimation of area of seabed occupied by marine debris displayed in Table 3.1 and in Table 3.2, it is considered highly unlikely that the success criteria will be reached from the debris removal campaign within the HHW SAC. Furthermore,

using these estimations (which are likely to be above average for the North Sea given that the heat mapping exercise (detail in Annex 3) was used to identify areas with high debris concentrations) to calculate a debris footprint per m^2, it is calculated that an area of 11,531km^2 would need to be surveyed to find enough debris to meet success from this work stream alone. To put 11,531km^2 in context, it is more than half the size of Wales, which is 20,779km^2.

244. Furthermore, The Norfolk Projects, notes that the SoS letter[2] dated the 30 October 2023 states that Natural England have concluded that the debris removal campaign completed by Hornsea Project Three "*demonstrated that there was a high probability that there would be insufficient marine debris to meet the* [The Norfolk Projects] *DCO requirements*. As described in section 3.2, results from Hornsea Project Three's debris removal campaign within the NNSSR SAC has also indicated that a very large area (which has been calculated by The Norfolk Projects as approximately 12,533 km^2) would need to be subjected to debris removal, in order to remove the 10.7ha required. The Norfolk Projects has also conducted further survey work in other areas of the HHW SAC and within the Inner Dowsing, Race Bank and North Ridge SAC which has resulted in similar, levels of marine debris being identified in the hot spots. Therefore, it would be wholly ineffective to continue searching for and removing marine debris from the seabed within SACs designated for benthic features using the methodologies deployed for work stream 1 (described in section 3.1).

3.9.1 Phase 1 of adaptive management

245. Given the above, and that the SoS letter of 30 October 2023 acknowledges that "*there is a wide scope to identify other locations for such recovery",* adaptive management will focus on the extension of work streams 2 to 5 described above in sections 3.2, 3.4, 3.5, and 3.6. Given that the five work streams combined are predicted to far exceed the required area any shortfall is likely to be small. Should removal of 8.3 hectares be achieved (but with 10.7 hectares yet to be reached), this would allow The Norfolk Projects to discharge the requirement for one of the DCOs. Given that Norfolk Vanguard West is the first project to proceed and is due to start cable installation preparation activities in July 2026, it would most likely be that project for which the requirement is discharged.

246. However, as compensation delivery of this nature has not been attempted before there is a chance (albeit a small one) that the success criteria are not met and, in the interim, other mechanisms for benthic compensation delivery may have been approved which could be delivered. Therefore, the BIMP includes a second option for adaptive management in order to ensure it is "future proofed".

247. As summarised in Figure 3.22, Adaptive Management Phase 1, if triggered, would be in the form of one of two alternatives:

a) Undertaking a second year (2025) of debris removal campaigns, in collaboration with all or a combination of: Ghost Fishing UK (in English waters); DDNZS (in other areas of the southern North Sea); NBC and KBT (to undertake further beach cleans); and/ or The Ocean Clean up (by undertaking further sea surface debris removal, possibly in the Atlantic); or

b) Developing alternative adaptive management options that may become available in consultation with the BSG. These could include payment into the Marine Recovery Fund (MRF), designating an extension of an SAC, or some equivalent suitable strategic measure. However, it should be noted that this BIMP is not reliant on the MRF being available for adaptive management.

248. For either of the above options the adaptive management under Phase 1 would be proportionate to the level of adaptive management required at that stage. This would be determined in consultation with the BSG and included in the proposals to be submitted for approval by the SoS in late 2024 (see Figure 3.21 and Paragraph 250). For example, The Norfolk Projects has been discussing possible support for Ghost Fishing UK future expeditions in North Cornwall, Teignmouth, Portland, Swanage, Isle of Wight, Littlehampton and Eastbourne which could be undertaken in late 2025 or 2026 and would result in the estimated removal of at least 900kg of nets.

249. Further search and debris removal within the HHW SAC or any other SAC designated for benthic habitats or species, has not been proposed as an option for adaptive management for the reasons described in section 3.9 above.

250. As part of the monitoring required (see section 3.10) the outcomes of all of the debris removal campaigns will be presented to the BSG at meeting 7 (see Figure 3.21). If the debris removal campaigns have been unable to meet the success criteria, 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.

3.9.1.1 Alternative 7a: Further debris removal

251. Alternative 7a (see Figure 3.22) would involve undertaking the equivalent steps presented in sections 3.3 to 3.6 to agree on what further debris removal campaigns would to be undertaken in 2025 to ensure that the 10.7ha success criteria is met.

3.9.1.2 Alternative 7b: Development of an alternative adaptive management option that may become available in consultation with the BSG

252. Should further options for adaptive management become available, these will be considered at that time and discussed with the BSG with the final form of adaptive measure being approved by the SoS. Therefore, alternative 7b (see Figure 3.22) would involve The Norfolk Projects identifying a suitable alternative compensation measure (such as designating an extension to an SAC), consulting on this with the BSG and making the relevant proposals to the SoS.

253. The quantum of adaptive management provided would be to offset effects equivalent to the area for which compensation had not already been delivered (i.e., marine debris not removed). For example, if it had been agreed that 9ha had been removed then the quantum of adaptive management to be provided would be to compensate for an area of 1.7ha).

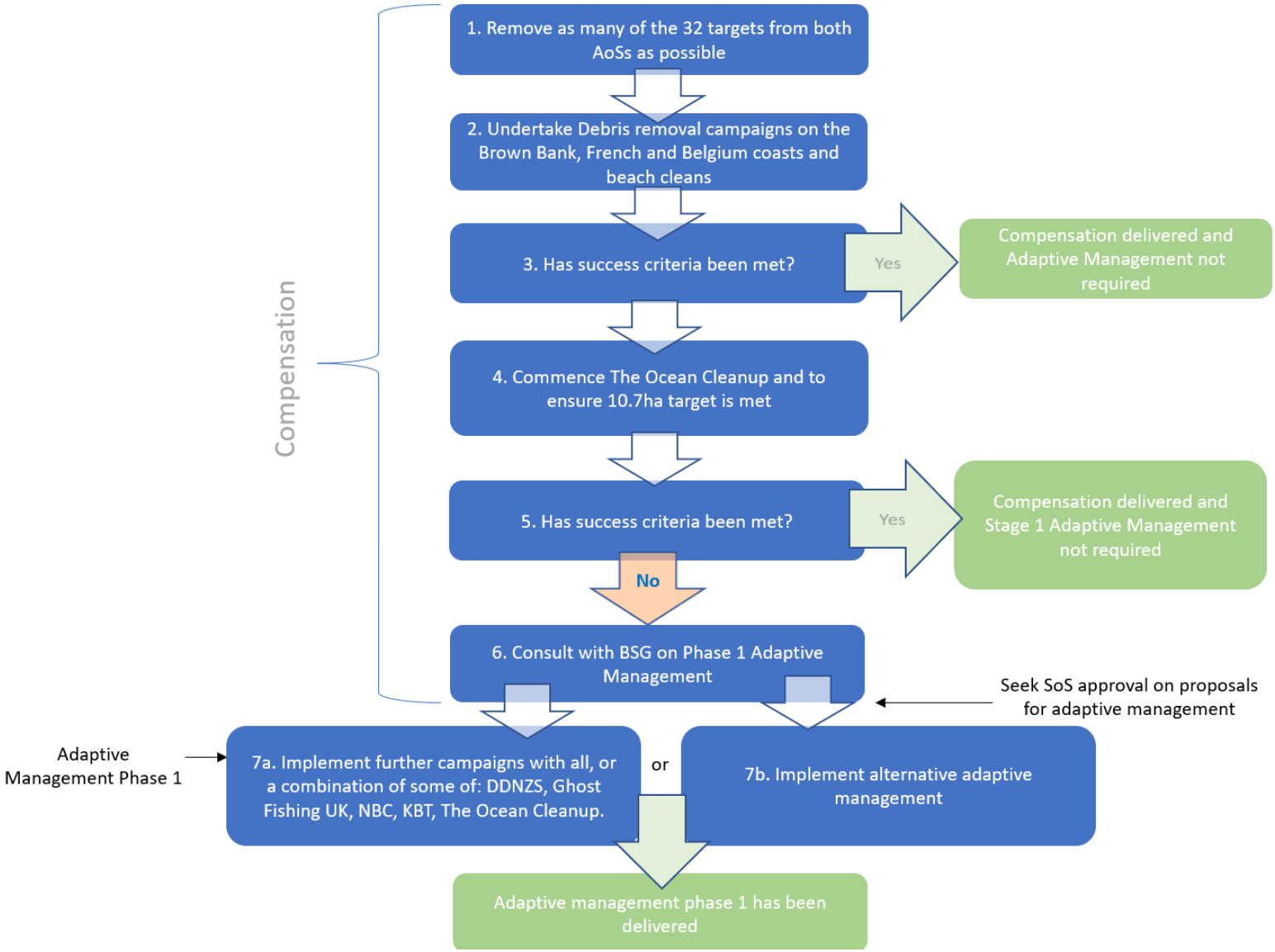


Figure 3.22 Process for Adaptive Management implementation

3.9.1.3 Following export cable installation

254. 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*"

255. Once the first export cable has been installed (this is anticipated to be the export cable for Norfolk Vanguard West), which is programmed to be completed in June 2027 it will be possible to determine whether effects of cable installation were greater than anticipated at the application stage (based on worst case calculations made within Chapter 5 of the Environmental Statements and presented within the Information to inform Habitats Regulations Assessment). If this is the case further compensation would be required. This would take the form of further marine debris removal (provided this had met the success criteria as either initial compensation or, if required, during Phase 1 adaptive management) from either, or a combination, of:

a) Debris removal from UK waters in collaboration with Ghost Fishing UK;

b) Debris removal from other areas of the southern North Sea in collaboration with DDNZS;

c) Debris removal from the beaches of eastern England in collaboration with Norfolk Beach Cleans and Keep Britain Tidy;

d) Debris removal from the sea surface in collaboration with The Ocean Cleanup.

256. Or, if marine debris removal had not met the success criteria, an alternative compensation measure would be discussed with the BSG and proposed to the SoS (these options are referred to as alternative 10a and 10b respectively in Figure 3.23). This final phase is termed Adaptive Management "Phase 2" and the process is illustrated in Figure 3.23.

257. For clarity and in accordance with the SoS's letter dated the 30 October 2023, these adaptive management proposals do not rely on the existence of the MRF despite the fact that legislation has been enacted for its creation. It has been included should a situation arise where it is felt that a strategic option which could include a contribution to the MRF is agreed to be the most appropriate form of adaptive management. Adaptive management options 7a and 10a would be relied upon in the event that an alternative option (with possible payment into the MRF) is not available or considered suitable for adaptive management.

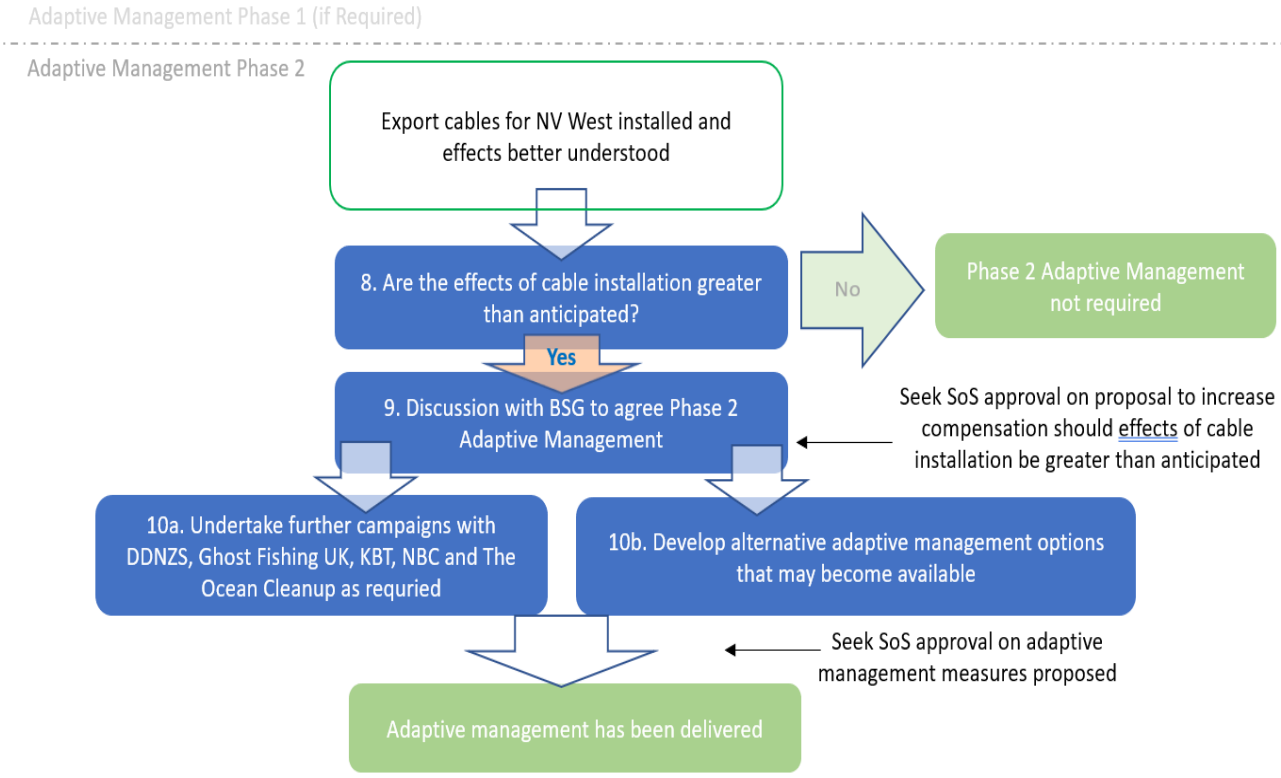


Figure 3.23 Process for Adaptive Management implementation should the effects of cable installation on the HHW SAC be greater than expected

3.10 Monitoring and reporting

258. This section describes the monitoring requirements for Strand 1 and includes:

- Marine debris removal from the HHW SAC; and
- Monitoring for debris removal in other areas.

259. The two different approaches to monitoring have been applied due to the fact that the first will be conducted within an SAC designated for benthic features whereas the others will be from wrecks, the sea surface and beaches. The techniques used for debris removal will be very different for the two approaches.

260. Monitoring of removal from the HHW SAC has been designed to assess the success of the removal campaign and to better understand how the seabed and therefore the designated features of the HHW SAC recover from the presence of marine debris.

261. Monitoring for debris removal in other areas has been designed to monitor the success of the different works streams in achieving the targets for debris removal and therefore each work streams contribution to the 10.7ha requirement.

3.10.1 Marine debris removal from the HHW SAC

262. 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.

263. Given the nature of likely marine debris to be removed and the SAC features, improvement in condition of the HHW SAC as a 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.

264. 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.

265. Subsequent monitoring will be undertaken on a minimum of five areas (if seabed impressions 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.

266. 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.

267. 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.

268. 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.

269. 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.

270. 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.

271. 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.

272. Therefore, monitoring/reporting 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.

273. Reporting of the ongoing activities will be discussed with the BSG and will reflect the period for which the monitoring campaign continues.

274. 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 3.21) 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 achieving the success criteria. If along with the four other work streams the success criteria are not met, proposals to address this through adaptive management (see section 3.9.1) will be agreed with the BSG and submitted to the SoS.

3.10.2 Marine debris removal from other areas of the North Sea

275. Agreements with both Ghost Fishing UK (section 3.3) and DDNSZ (section 3.4) include the requirement for these organisations to report on the material recovered to enable The Norfolk Projects to calculate the area of debris that has been removed. Monitoring for these activities will relate to reporting.

276. Monitoring of debris removed and the subsequent reporting will reflect the period for which the campaign continues and will include:

- Location of the operation;
- Weight of the material removed (kg);
- Nature of the material removed (e.g., gill net, pot etc.);
- Size of material removed where appropriate (netting area will be calculated using weight conversions as described in sections 3.3.3.1 and 3.4.3.1);
- The method of disposal of the debris (or where practicable whether material has been successfully returned to owners);
- If practical, reporting on the organisms that have colonised the nets or have been entangled in the net via ghost fishing.

277. Both Ghost Fishing UK and DDNSZ have their own reporting procedures which will be followed and unaltered. It is not proposed that any monitoring will be required in relation to these methods of debris removal once the removal has taken place.

3.10.3 Marine debris removal from beach cleans

278. Marine debris removal from beaches in southeast England will include the requirement for data collection and reporting. Data collection would inform an end of year campaign report to ascertain the volume of material recovered and therefore how much material has been removed or prevented from re-entering the marine environment. This will demonstrate whether or not the benthic compensation condition can be successfully discharged.

279. Monitoring of the debris removed and its subsequent reporting will reflect the period for which the campaign continues and will include:

- Weight of material recovered (kg);
- A percentage breakdown of the type of beach litter collected (wet wipes, glass bottles, plastic pieces, fishing gear etc);
- A breakdown of the various end of life recycling pathways the material took following its collection.

280. Norfolk Beach Cleans have agreed to take a 1 in 20 sample of its debris bags collected and extend the contents over an area which will then be measured, this

information will then be reported to The Norfolk Projects to allow verification of the conversion factors used in section 3.5.3.

281. It is not proposed that any monitoring will be required in relation to these methods of debris removal.

3.10.4 Marine Debris removal from the sea surface

282. The Ocean Cleanup removal campaign will include reporting as set out above. Reporting of the activities will reflect the period for which the campaign continues and will include:

- Location of the operation;
- Weight of the material removed (kg);
- Nature of the material removed (e.g. type of plastics, nets etc.);
- Size of material removed where appropriate (netting area will be calculated using weight conversions as described in section 3.6.4.1

3.10.5 Other monitoring requirements

283. The Norfolk Projects has a requirement to monitor the effects of cable installation on the designated features of the HHW SAC. These are secured through the In Principle HHW SAC Cable Specification, Installation and Monitoring Plan as follows:

- Where no *S. spinulosa* reef is identified by the pre-construction geophysical survey of the proposed works (and associated buffers), no further post-construction surveys will be undertaken;
- Where *S. spinulosa* reef is identified during the pre-construction survey and cannot be entirely avoided through micrositing, a single post-construction survey, specifically targeting those reefs identified in the baseline survey will be undertaken as a check on their condition using the same methodology set out for pre-construction monitoring.
- If required, survey programmes and methodologies for the purposes of monitoring shall be submitted to the MMO for written approval in accordance with the timeframes set out in the DMLs and conducted within the first year post commissioning of the proposed wind farm.
- The duration over which monitoring of recovery is required would be agreed with the MMO following review of the postconstruction survey data.

284. Further details of these surveys will be agreed with Natural England and the MMO through the discharge of the final HHW SAC Cable Specification, Installation and Monitoring Plan (further detail on the discharge procedure for this document is included within section 5). Following these surveys, the geophysical data will be

analysed to identify marine debris items and monitor whether there is any trend in the number and size of items identified. The findings of this reporting will assist Natural England in their future site condition monitoring.

3.10.6 Adaptive management

285. Adaptive management for the marine debris removal strategies is outlined in section 3.9. Alternative 7a of adaptive management relates to providing funding for further marine debris removal campaigns. Determining adaptive management activities will be discussed with the BSG, and reporting requirements of these activities will likely be the same as in the first year of funding, as set out in sections 3.10.2 to 3.10.4. Reports will be provided on the nature, size and location of debris removed.

286. Alternative 7b relates to the implementation of alternative adaptive management which could include the contribution by The Norfolk Projects to a suitable strategic compensation measure. For the alternative, the monitoring would be appropriate to the compensation measure proposed and if the alternative was a strategic measure the value of the contribution made to it would include the relevant allocation for monitoring.

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

287. 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.

288. 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.

289. 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 3.21 and are further detailed in Annex 4.

4.1 Method statement

290. In order to discharge the requirement, The Norfolk Projects has been collaborating with the Eastern Inshore Fisheries Conservation Authority (Eastern IFCA), and the East of England Plastics Coalition (EEPC) Marine Debris Working Group. This group has been working together since August 2022 to develop and embark on the plan set out below.

291. Plans to deliver this campaign (subject to timely approval of the BIMP) have been refined and improved over the last 12 months as more detailed logistics have been discussed. An updated version of the full campaign scope is provided in Annex 4.

292. 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 two groups targeting unflushables and marine debris.

293. The Norfolk Projects recognised significant synergies between what is needed to discharge this second strand and the vision that the EEPC are working towards. A proposal for collaboration was put forward and accepted by the EEPC.

294. Together The Norfolk Projects, the EEPC and the Eastern IFCA are now working to organise a series of amnesty days with underpinning stakeholder engagement in an

iterative manner that leaves flexibility to increase the campaign scope. These amnesty days will provide a positive solution for local fishermen to dispose of redundant fishing gear with an end-of-life pathway to recycling facilities.

295. The Norfolk Projects has agreed to commit to part-fund the EEPC secretariate and have been doing so for the past year. Continued funding is contingent on approval of the BIMP.

296. The core elements of the Strand 2 compensation plan are outlined below.

4.1.1 Collaboration area 1: Amnesty days

297. This primary element of the campaign targets damaged or unused fishing gear that lies dormant in yards which may otherwise enter the marine environment. The Norfolk Projects is working with the Eastern IFCA to deliver an amnesty day at Lowestoft which would involve the deployment of a large commercial skip where fisherman could deposit their hard to recycle fishing gear and any other marine debris. The Norfolk Projects will fund the end of life recycling pathways which have been arranged through the EEPC with Odyssey Innovation, MyGroup and ReFactory. This translates to the provision of a free recycling solution to a normally expensive problem for fishermen in the Norfolk and Suffolk area.

298. The first amnesty day would not be open to the general public, rather targeted specifically at the fishing community. The Norfolk Projects would work together with the Eastern IFCA and the EEPC to arrange the next amnesty day in Lowestoft as well as consider the expansion of the geographical scope with additional amnesty day sites. As the scope of the amnesty days broadens, the general public may be able to participate at appropriate locations. There is also scope to introduce smaller bins at strategic locations (popular beaches and harbours) in addition to the large commercial skips.

299. During the first year of the campaign The Norfolk Projects is aiming to deliver 4 amnesty day events with the support of the Eastern IFCA. However, this is contingent on BIMP approval.

300. The debris gathered would be sorted into material type, and prepared for the relevant onward pathway. As part of this work stream and subject to BIMP approval, the Eastern IFCA would organise the handling and transport of materials to the relevant processors for recycling which would be supported by the EEPC and funded by The Norfolk Projects. Data collected during this exercise will provide a measurable way to demonstrate how this strand of benthic compensation is succeeding with its aims.

4.1.2 Collaboration area 2: Engagement with fishermen

301. This second collaboration area focuses on Norfolk fisheries (especially those who fish in the HHW SAC).

302. 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."

303. 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 of targeted engagement events to develop some of these concepts.

304. The amnesty campaign concept would be sensitively introduced, to "set-the-scene" and provide some context. The following topics will be discussed:

- Current experiences with marine debris;
- Approximation of quantities (maximum potential and likely) for deposit in amnesty day skip
- The details of the amnesty days – location, date, reason, end of life pathway
- How they can work with The Norfolk Projects to develop further ideas for marine debris prevention; and
- What potential barriers/challenges they foresee

305. The EEPC have informed The Norfolk Projects that these initial conversations are critical to the success of any marine debris mitigation campaigns. It will be during this second element of the campaign that key information is gathered to inform future plans to increase the scope of collaboration area 1.

306. As the scope of the amnesty days increase, this stakeholder engagement element of the campaign may grow to encompass the general public into the discussion points outlined above.

4.1.3 Creation of code of best practice for the HHW SAC

307. 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,

308. The HHW SAC compensation plan states that possible ways that The Norfolk Projects could assist the fishing industry in minimising its impacts on the marine environment should be identified.

309. 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) (EIFCA 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 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

310. The Norfolk Projects will monitor the progress of Strand 2 by requiring the EEPC to work closely with the Eastern IFCA to produce annual reports and progress updates, summarising 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.

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

4.3 Collaboration with Hornsea Project Three

312. The Norfolk Projects and Hornsea Three (being developed by Ørsted) are neighbouring offshore wind projects. In the spirit of collaboration, The Norfolk Projects has remained open to creating a partnership with Hornsea Three to combine resources to deliver this marine debris awareness campaign.

313. The Norfolk Projects is conscious of the risk of sending a confused message and if collaboration with Hornsea Three does proceed, alignment on messaging and branding would be required.

314. At the time of writing, The Norfolk Projects and Hornsea Three are in discussions and hope to reach a mutually beneficial outcome to deliver an effective campaign to mitigate the marine debris problem. However, for clarification The Norfolk Projects

intends to proceed with this Strand 2 scope of works irrespective of Hornsea Three's involvement.

5 AVOIDING IMPACTS TO THE HHW SAC

315. 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*".

5.1 Cable specification, installation and monitoring plan

316. 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)."*

317. This plan will be developed for all of The Norfolk Projects (not just Norfolk Boreas) and will describe in detail how impacts to the HHW SAC will be avoided as far as possible. This document will be produced between 12 and 6 months prior to export cable installation. It is crucial that this requirement is discharged at this late stage as that is when the detailed design for the cable installation will be known and the final locations of Annex I Sabellaria reef will also be known. Sabellaria reef is ephemeral and therefore attempting to discharge this document any earlier would mean that micrositing to avoid the feature would be ineffective. The HHW SAC CSIMP document will be discharged by the MMO in consultation with Natural England. The Norfolk Projects has also programmed and agreed extensive pre-application consultation on this document with both Natural England and the MMO, which has already commenced.

318. 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.

319. 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).

5.2 Protected reef habitats within designated sites

320. As stated above, the Benthic Compensation Schedules require that the BIMP should provide "*details of how all impacts to protected reef habitats within the HHW SAC will be avoided where possible"*, and the precise details of this will be included within a HHW SAC CSIMP which can only be prepared within 6m to 12m prior to cable installation. Notwithstanding this, the marine debris removal process itself will also avoid impacts to the features of the HHW SAC. Therefore, this section sets out how impacts will be avoided during the marine debris removal campaign in the HHW SAC (work stream 1) and includes preliminary information on how impacts would be avoided during export cable installation (noting that the final detail on this will be provided in the HHW SAC CSIMP for the reasons given above).

5.2.1 Avoiding impacts during marine debris removal

321. Section 3.1.3 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 known Annex 1 reef locations and these were treated as hard constraints within which no marine debris removal or survey would occur.

322. Section 3.1.6.2 explains how impacts to as yet unknown Annex 1 Sabellaria reef would be identified and avoided through the use of 100m video transects being completed by the ROV prior to any debris removal. Should Annex I reef be identified attempts to remove that debris item would be abandoned.

323. Furthermore, the decision tree process, explained in section 3.1.6.2, confirms that during the removal of marine debris items 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.

324. Marine debris removal to be undertaken during work streams 2 to 5 will not be undertaken in SACs designated for either Sabellaria reef or sandbanks. Nonetheless measures have been put in place to reduce or avoid any environmental impacts from these operations as described above in sections 3.3.4.2, 3.4.4.2, 3.5.4.1, and 3.6.5.2.

5.2.2 Avoiding impacts during export cable installation

325. Although, as explained above in section 5.1 the final mitigation for impacts on Annex I Sabellaria reef will be secured within the HHW SAC CSIMP, work has already commenced on these mitigation measures.

326. The most effective way to mitigate against impacts to Annex I Sabellaria reef is through careful route planning to avoid it. In order to do this, it is necessary to understand where the Annex I Sabellaria is located. Comprehensive surveys to map Annex I reef within the offshore cable corridor boundary which overlaps the HHW SAC were undertaken in 2020. The findings from the 2020 surveys resulted in two separate routes being considered for each export cable. One "the base case" which represents the best option from an engineering point of view and minimises the amount of material to be dredged, therefore having the smallest impact on sandbanks. The second "the Alternative route" which has been designed to avoid Annex I Sabellaria reef as far as possible. The base case and the alternative route are both displayed in Figure 5.1.

327. The Alternative routes avoid all currently known areas of Annex I Sabellaria reef apart from a very small section (less than 250m for Vanguard West and 775m within Vanguard East). Natural England and the MMO have been consulted during this process and although Natural England have a preference for alternative routes, they do recognise that the cables can be installed at any location within the cable corridor.

328. Surveys have commenced and will continue to gather very high-resolution data, including drop down video surveys for Sabellaria reef using a 250m wide corridor for both the base case and alternative route. The Norfolk Vanguard West cable route surveys started in late 2023 and are ongoing with surveys for Norfolk Vanguard East and Norfolk Boreas planned for 2024 and 2025. The data collected from these surveys will be used to undertake the "micro routing" which, following consultation with Natural England, will result in the final detailed design for the routes being established. During the micro routing further steps will be taken to avoid the latest known areas of Annex I Sabellaria reef and further studies will be completed on the feasibility of each route, the findings of which will be detailed within the CSIMP along with the final detailed design for each export cable route.

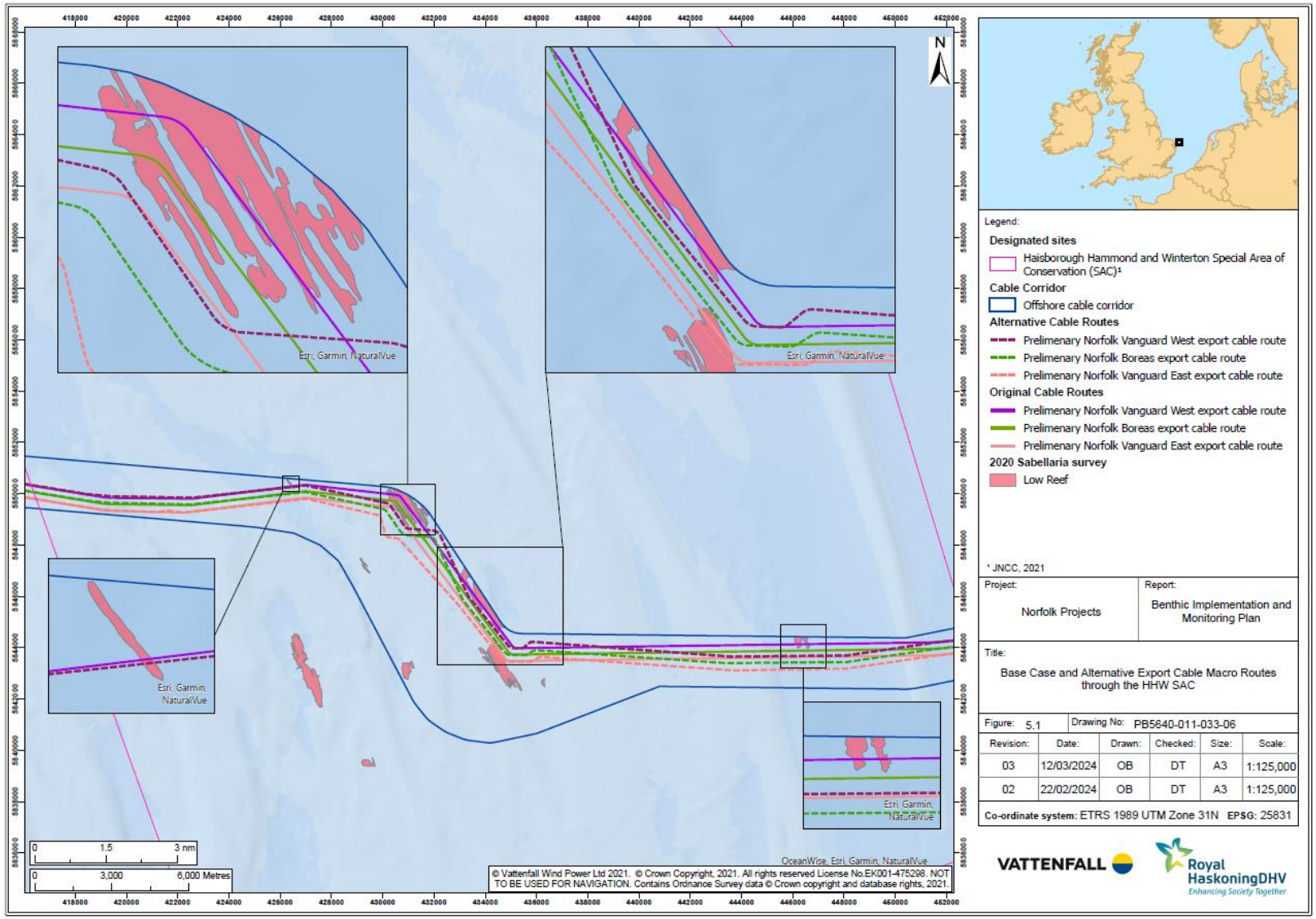


Figure 5.1 Map base case and alternative Cable routes avoiding all Sabellaria reef

329. The Norfolk Projects remains committed to not installing external cable protection within the HHW SAC unless absolutely necessary (as per the commitments made in the HHW SAC Outline Cable Specification Installation and Monitoring Plan: Document 8.20 for the Norfolk Boreas and Norfolk Vanguard DCO applications) and currently do not envisage the need for any such cable protection at any location within the HHW SAC. This will be confirmed during the detailed design stage once the high-resolution survey data has been analysed and a cable burial risk assessment completed.

330. 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.

5.3 Management of dredging and disposing of material

331. 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."*

332. As presented in section 3.1.6, the proposed methodology for removal of marine debris does not include dredging of the seabed therefore there will be no disposal of dredged material.

333. The SoS's letter dated 30 October 2023 stated that:

> *"(i) The Secretary of State has not identified any details of the locations for the disposal of dredged material, nor evidence that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features."*

334. As described in section 5.1, the final mitigation measures for impacts to both Sabellaria reef and Annex I sandbanks will be agreed through the discharge of the HHW SAC CSIMP once the detailed design is available as well as the results of preconstruction surveys. However, in order to discharge this condition in the Benthic Compensation Schedules, preliminary work has been undertaken to define broad disposal areas. The process for locating these areas has adhered to the following requirements:

- Disposal areas should be at least 50m away from confirmed Annex I *Sabellaria Spinulosa* reef;*
- Disposal of material up drift of the cable route, to allow infill to occur as quickly as possible following cable installation, subject to not hampering overall dredging methodology and works.*
- Disposal of material as close as possible to cable route, if practically possible with respect to avoidance of infill before completion of cable burial works.
- Disposal of dredged sediment by using a fall pipe from the dredging vessel to achieve a more controlled disposal.*
- Keeping dredging volumes within the consented limit within the HHW SAC of 500,000m^3 per DCO. *
- Reducing actual seabed level as needed for the trencher tools to achieve target burial depth.
- Observing dredging exclusion zones, e.g. in proximity of existing assets.
- Sediment originating from within the SAC area will be disposed of within the SAC area.*

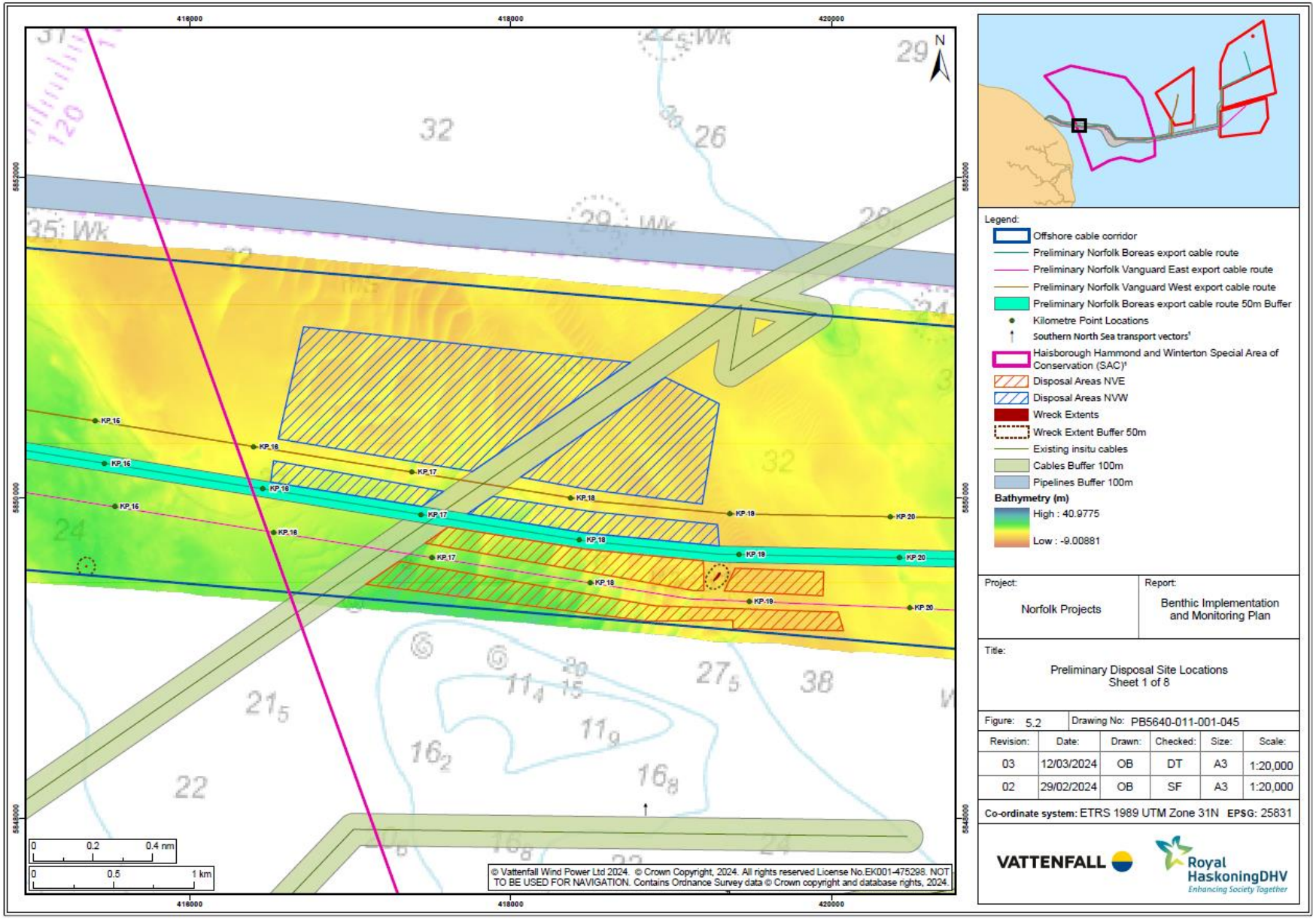
335. All of the above requirements which are identified by a * symbol will ensure that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features. Evidence from other wind farms demonstrates that sandbanks and sandwaves are likely to rapidly recover from cable installation dredging activities (DONG 2017 and Larsen et al 2019) regardless[13], however, by ensuring that the above requirements are adhered to, this provides the best chance for that to be achieved.

336. By following these requirements, the areas shown in Figure 5.2 have been determined. This have been carefully aligned with the predominant transport vectors and near seabed tidal currents to ensure that all disposed material remains within the system. It should however be noted that these are preliminary “areas” which will be refined in consultation with Natural England and the MMO once data from the ongoing surveys described above and the resultant micro routing has been undertaken. The final refined disposal “site” locations will be agreed through the HHW SAC CSIMP requirement discharge.

[13] Evidence of sandwave recovery was submitted in “The Applicant's Response to the Request for Additional Information” to the Norfolk Boreas Examination in August 2021. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002841-The%20Applicant's%20Response%20to%20Request%20for%20Further%20Information.pdf

337. The disposal areas have been defined using the alternative routes which avoids almost all of the known areas of Annex I Sabellaria reef (see section 5.2 for further information).

338. Figure 5.2 Shows the preliminary “areas" within which the disposal sites for Norfolk Vanguard East and Norfolk Vanguard West will be located. The Norfolk Boreas development programme is approximately two years behind Norfolk Vanguard West and therefore a separate exercise for that project has not been completed at this stage. However, the Norfolk Boreas disposal site locations will be within the areas already identified in Figure 5.2 and will follow the requirements outlined above. As described above, the Norfolk Vanguard West and Norfolk Vanguard East disposal sites will be further refined and reduced in size and as this process occurs, the Norfolk Boreas disposal sites will be designed to occupy some of the remaining areas (within the preliminary areas) not used by the other projects. The final disposal site locations for all projects will be agreed through discharge of the CSIMP that is relevant to that project.


Legend:
Offshore cable corridor
Preliminary Norfolk Boreas export cable route
Preliminary Norfolk Vanguard East export cable route
Preliminary Norfolk Vanguard West export cable route
Preliminary Norfolk Boreas export cable route 50m Buffer
Kilometre Point Locations
Southern North Sea transport vectors[1]
Haisborough Hammond and Winterton Special Area of Conservation (SAC)[2]
Disposal Areas NVE
Disposal Areas NVW
Wreck Extents
Wreck Extent Buffer 50m
Existing insitu cables
Cables Buffer 100m
Pipelines Buffer 100m
Bathymetry (m)
High : 40.9775
Low : -9.00881
Project:
Norfolk Projects
Report:
Benthic Implementation and Monitoring Plan
Title:
Preliminary Disposal Site Locations
Sheet 1 of 8
Figure: 5.2
Drawing No: PB5640-011-001-045
Revision: Date: Drawn: Checked: Size: Scale:
03 12/03/2024 OB DT A3 1:20,000
02 29/02/2024 OB SF A3 1:20,000
Co-ordinate system: ETRS 1989 UTM Zone 31N EPSG: 25831
0 0.2 0.4 nm
0 0.5 1 km
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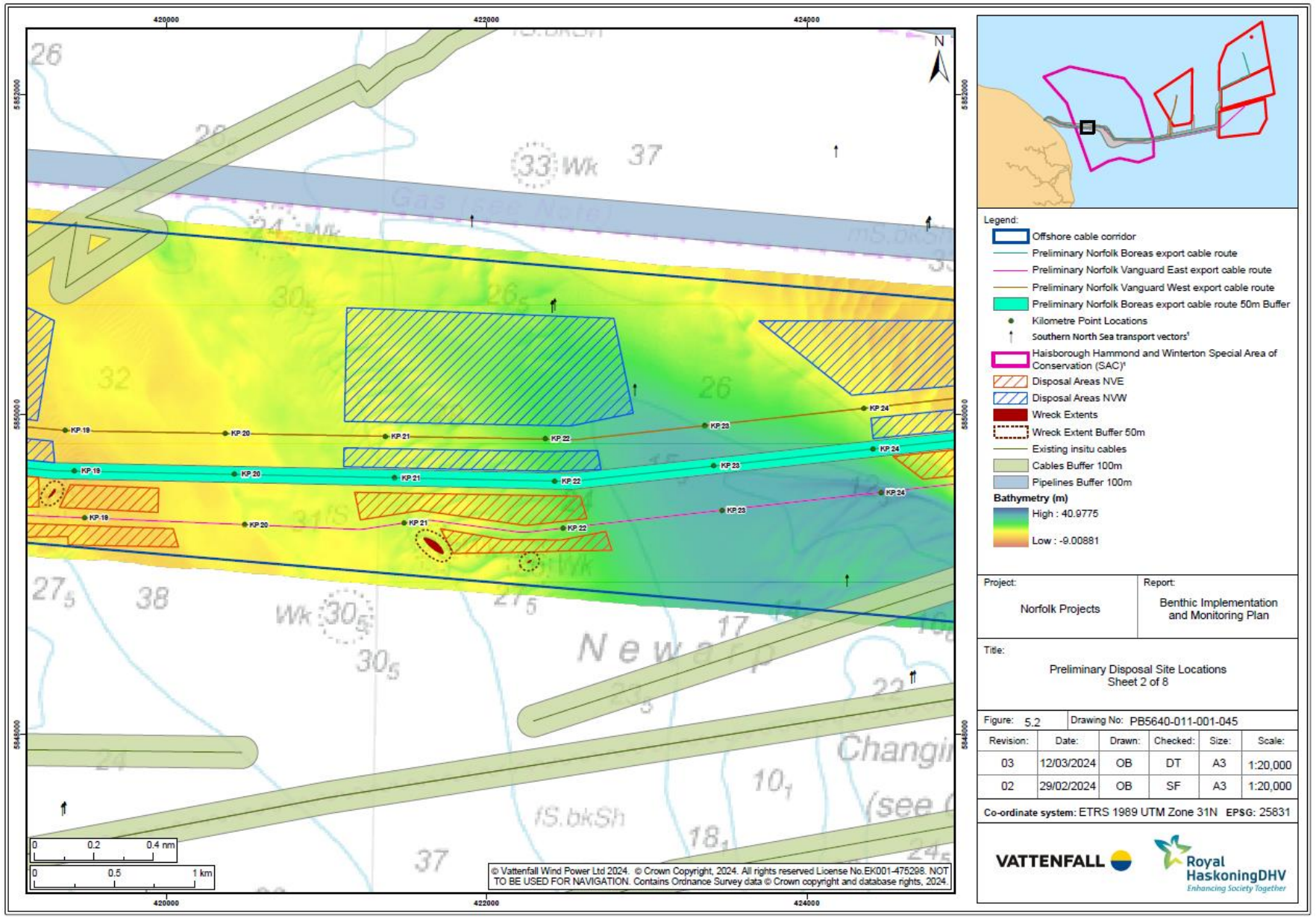
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Legend:
Offshore cable corridor
Preliminary Norfolk Boreas export cable route
Preliminary Norfolk Vanguard East export cable route
Preliminary Norfolk Vanguard West export cable route
Preliminary Norfolk Boreas export cable route 50m Buffer
Kilometre Point Locations
Southern North Sea transport vectors[1]
Haisborough Hammond and Winterton Special Area of Conservation (SAC)[1]
Disposal Areas NVE
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Wreck Extent Buffer 50m
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High : 40.9775
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Report:
Benthic Implementation and Monitoring Plan
Title:
Preliminary Disposal Site Locations
Sheet 2 of 8
Figure: 5.2
Drawing No: PB5640-011-001-045
Revision: 03 Date: 12/03/2024 Drawn: OB Checked: DT Size: A3 Scale: 1:20,000
Revision: 02 Date: 29/02/2024 Drawn: OB Checked: SF Size: A3 Scale: 1:20,000
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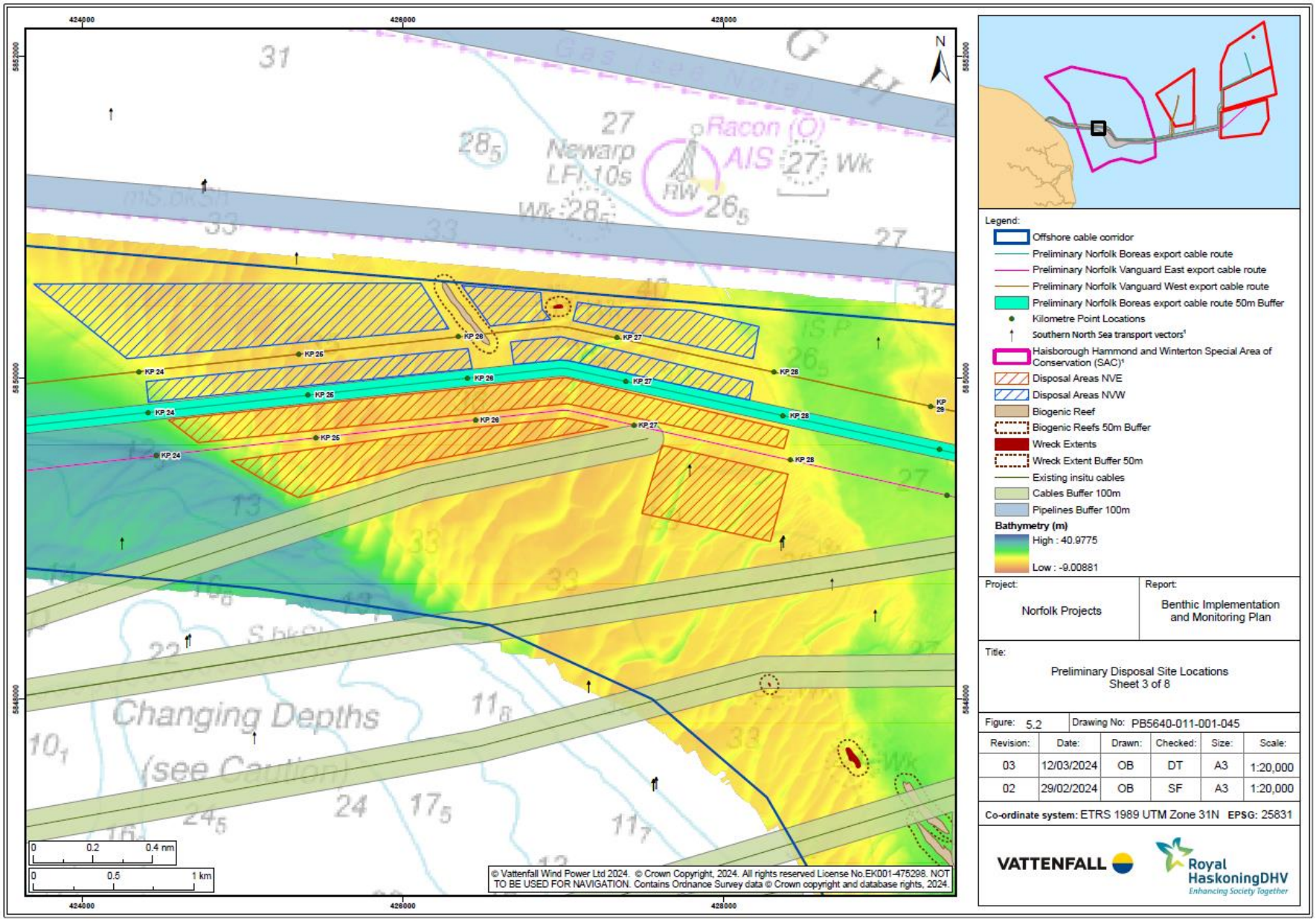
Enhancing Society Together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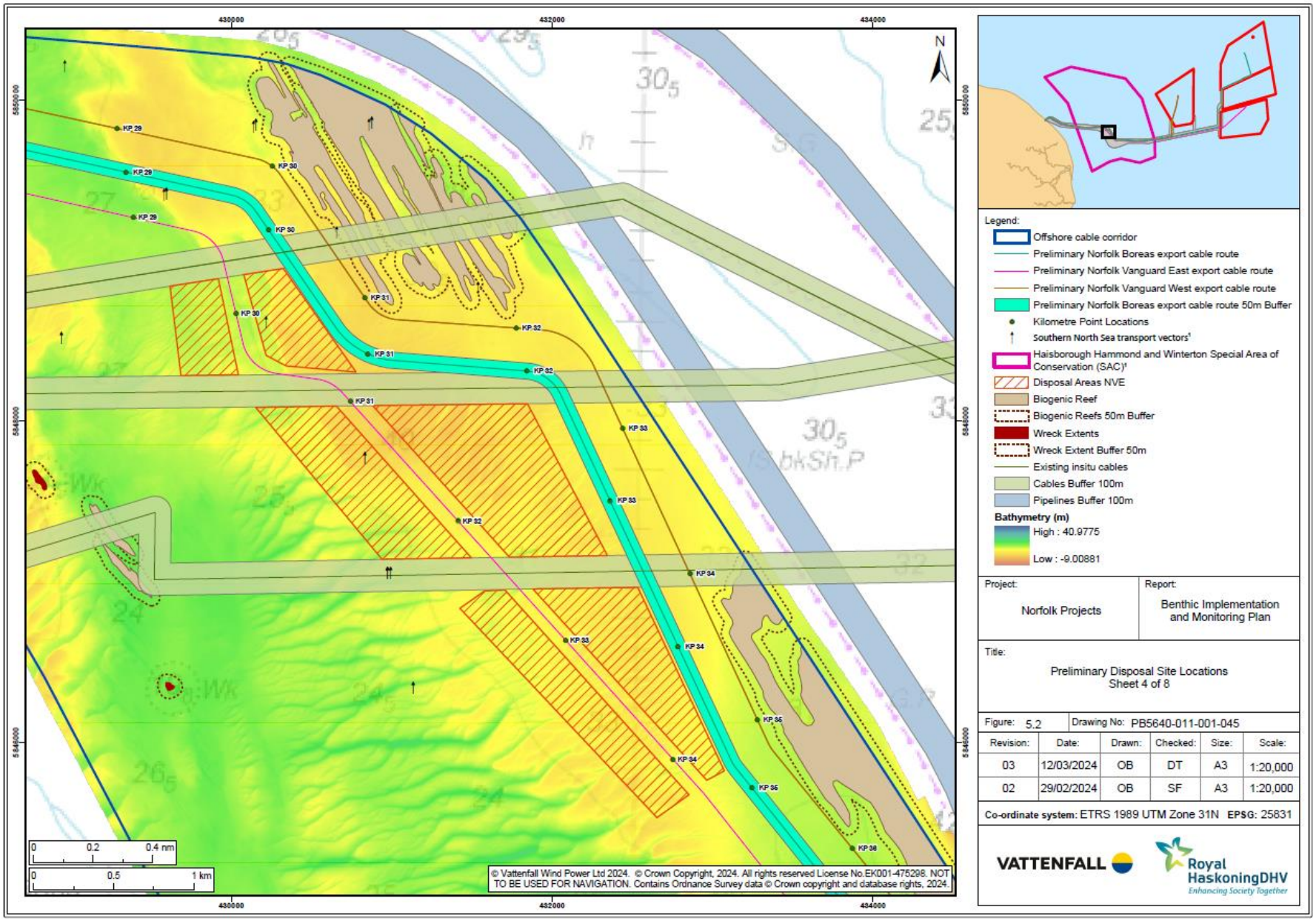
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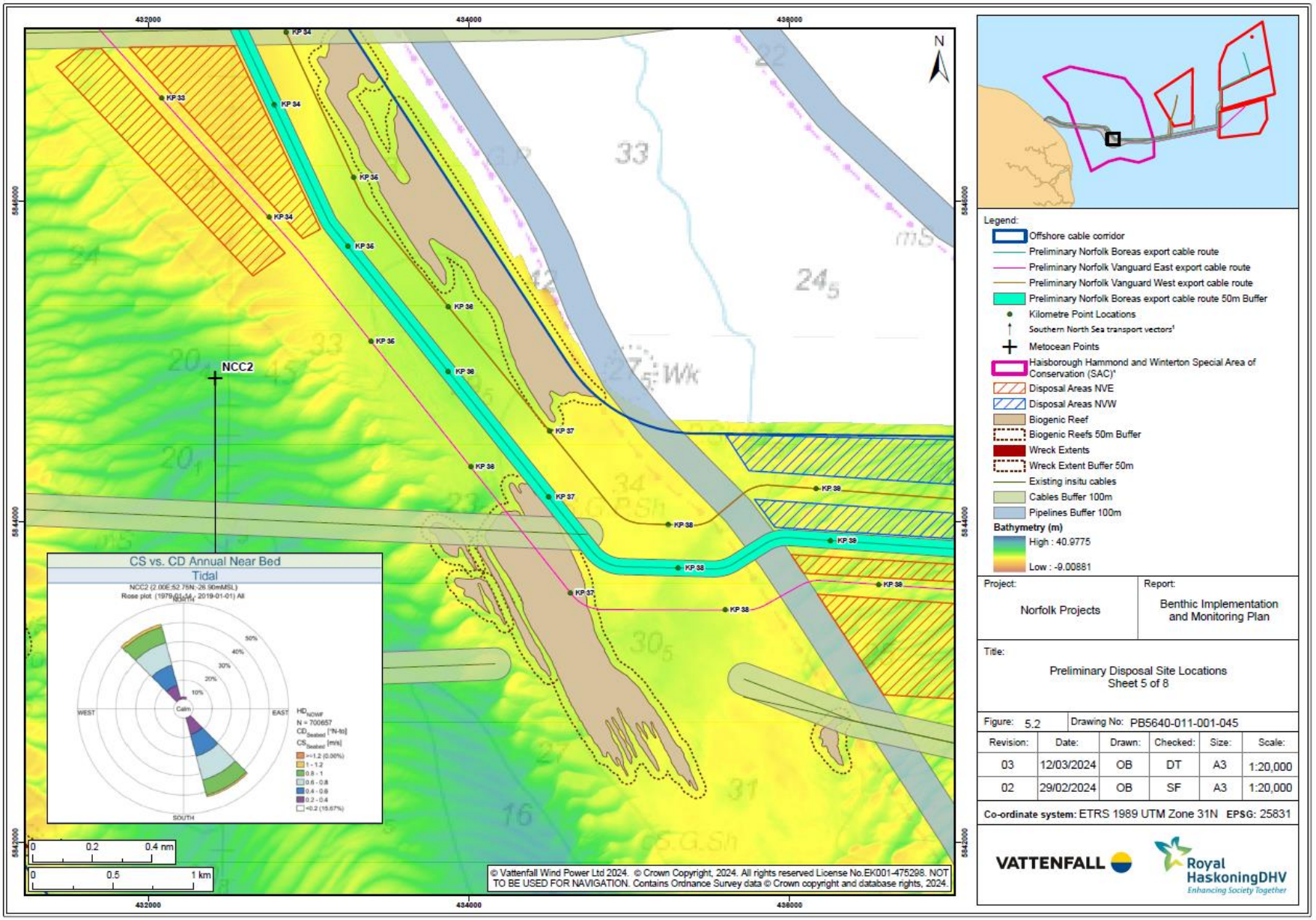
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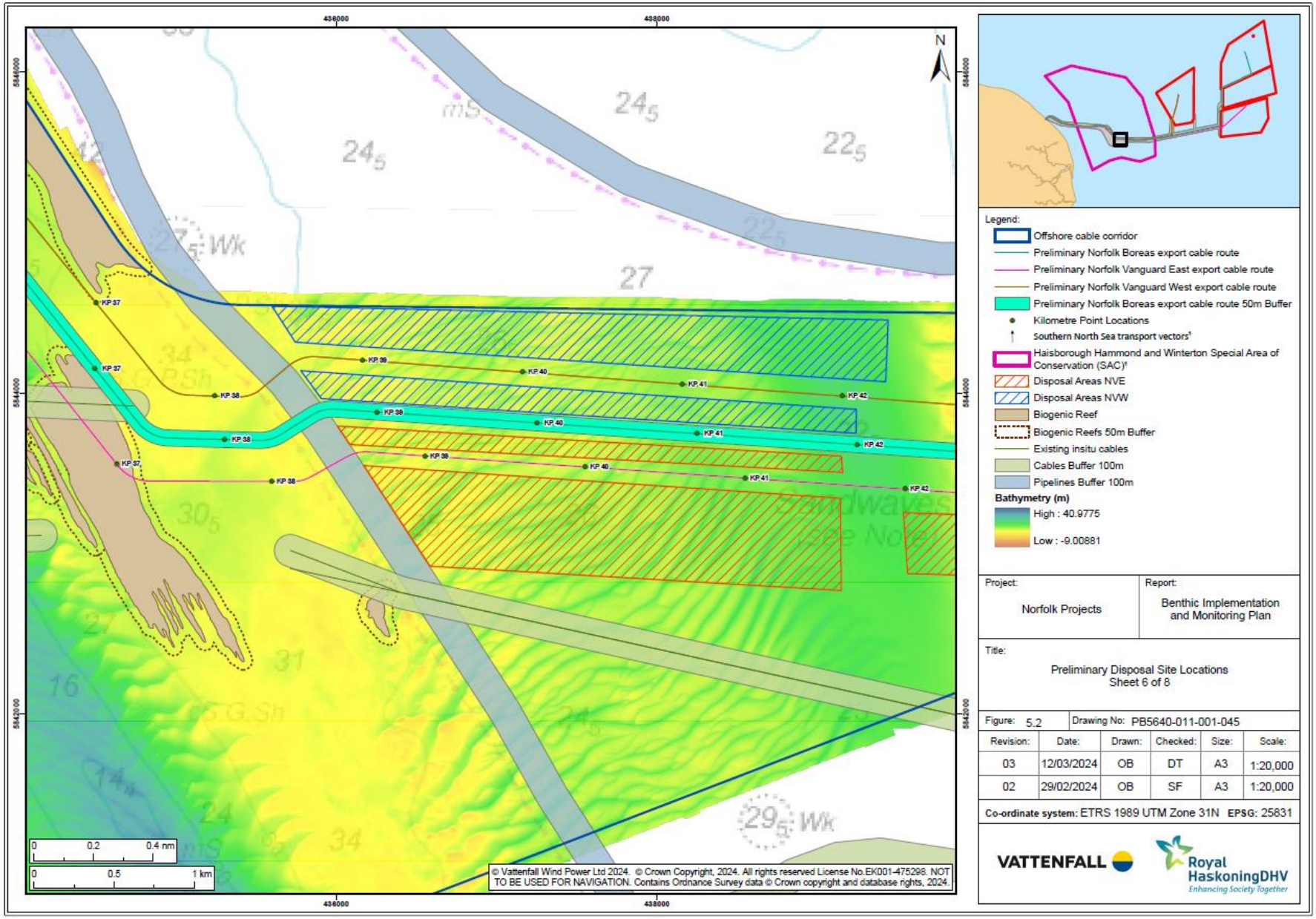
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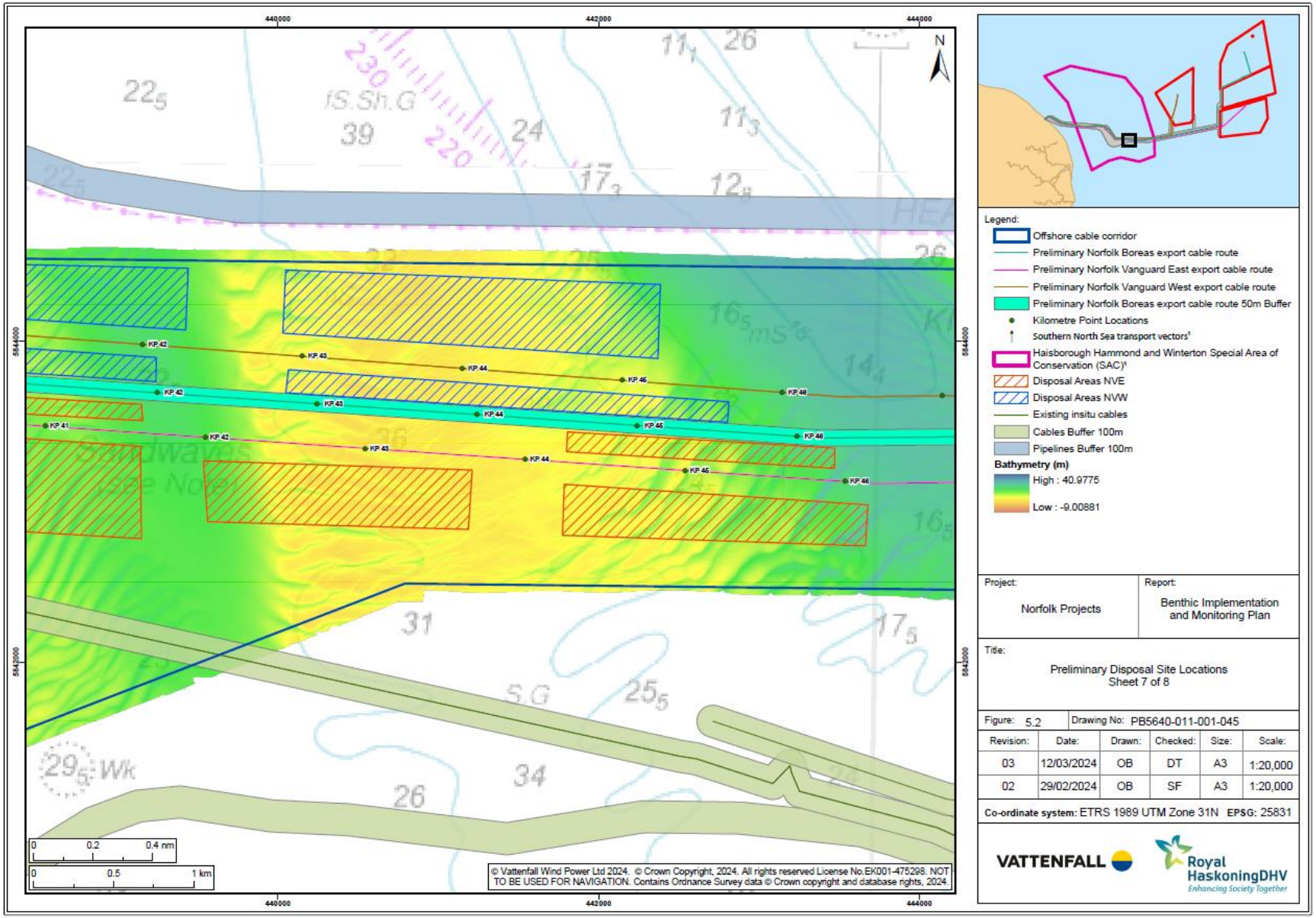
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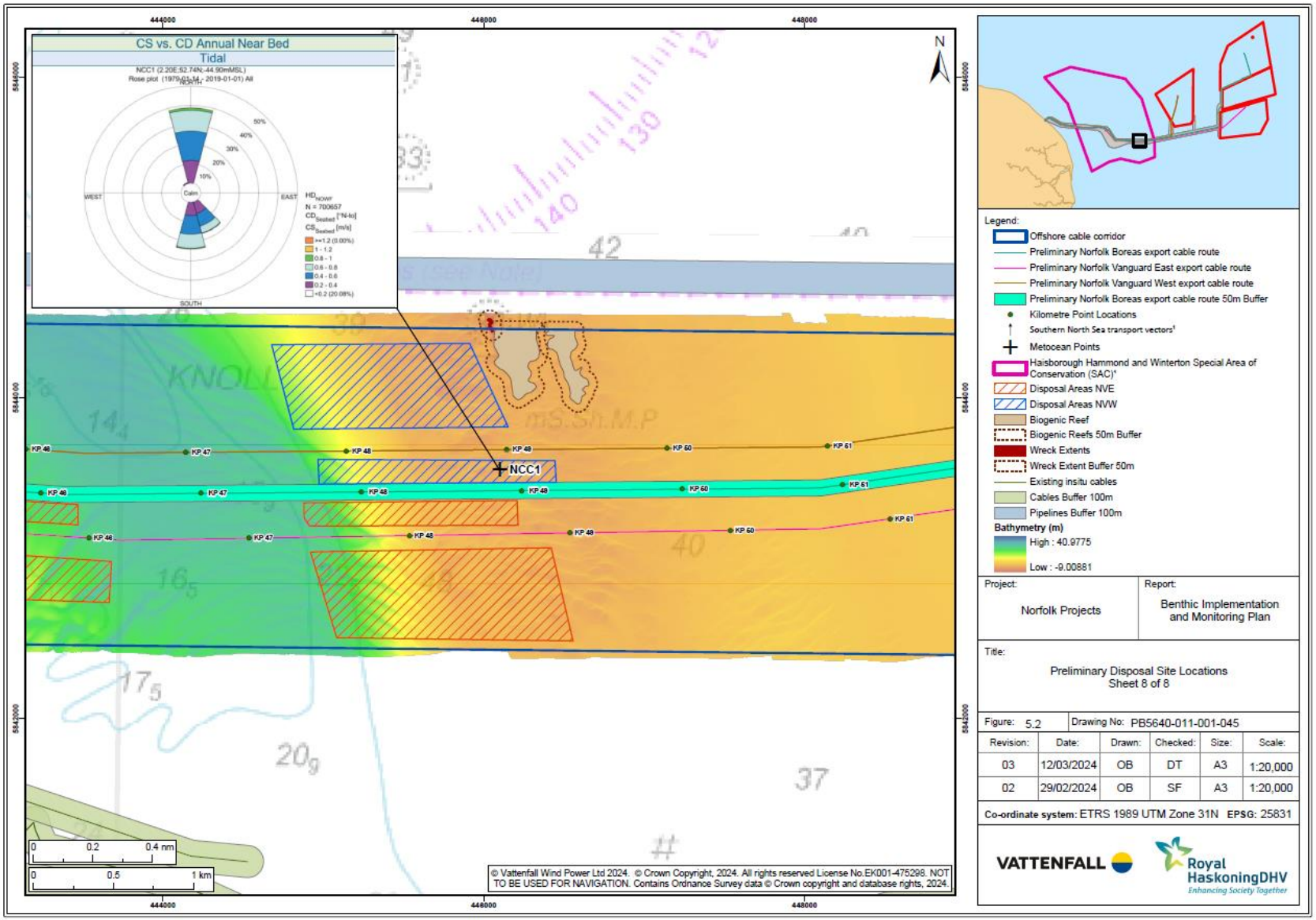

Figure 5.2 Maps showing preliminary sediment disposal locations (broad areas to be refined during the detailed design process)

6 CONCLUSION

339. The 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 Monitoring Plan under both DCOs.

340. The document demonstrates compliance with sub paragraphs a) to i) within paragraph 29 of the Benthic Compensation Schedules. Particularly, through collaboration with partners who have experience of recovering marine debris, that the requirement to remove 10.7ha of marine debris prior to cable installation will not only be met but is likely to be exceeded. And this is notwithstanding recently acquired evidence which indicates that the quantity of marine debris in the HHW SAC (and other SACs designated for similar benthic habitat) is limited, in both number of items and the size of those items.

341. This document also seeks to address the comments from SoS which were provided within a letter sent to The Norfolk Projects on the 30 October 2023.

342. This document illustrates that significant progress has already been made, in partnership with numerous different organisations, toward 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 as well as a significant environmental benefit for the marine environment at the same time.

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ANNEX 1: DIFFERENCE IN WORDING OF THE DCO BENTHIC COMPENSATION SCHEDULES

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	(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

Norfolk Boreas	Norfolk Vanguard
carried out if the actual effects of cable installation and protection on the HHW SAC are greater than anticipated;	carried out if the actual effects of cable 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)

ANNEX 3: NORFOLK PROJECTS MARINE DEBRIS IDENTIFICATION DESK STUDY (SUBMITTED AS A SEPARATE DOCUMENT)

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

ANNEX 5 INCLUSION OF FURTHER DETAIL IN RESPONSE TO THE SOS COMMENTS IN LETTER OF 30 OCTOBER 2023

SoS comment	Response in Version 2 of the BIMP
The BIMP contains details of two proposed areas of search. The Secretary of State notes that the BIMP does not include details of the location, nature and size of the materials, and there is no evidence that this will equate to no less than 8.3 hectares for each project.	Version 1 of the BIMP included the coordinates for the target items to be removed from the Primary area of search, this information has been retained in version 2 and is included within Table 3.1. Version 2 of the BIMP contains estimated sizes of the items of marine debris which have been identified within the Primary and Secondary areas of search (in Table 3.1 and Table 3.2. A review of the data has been completed and assumptions about the nature of the material is reported in paragraph 57. Details of the location, nature and size (or weight) of marine debris targets for four new work streams is included within sections 3.3.3, 3.4.3, 3.5.3 and 3.6.4. With the inclusion of these new work streams, it has been demonstrated that the 8.3ha (or 10.7ha for both projects in-combination, see Annex 12 for detail) requirement will be exceeded (see Figure 2.1) and it is estimated that an area of over 82ha will be achieved.
The Secretary of State notes that the BIMP contains a method statement for debris removal, but notes that it does not detail the vessel type and tools to be used, nor details of how impacts on surrounding non-Annex I reef habitat will be minimised.	Vessel types to be deployed on the four work streams that require vessels are included in sections 3.1.6.1.1, 3.4.4.1, 3.3.4.1, and 3.6.5.1. Details of the tools used for the one work stream (Work stream 4) that does not require vessels is described in section 3.5.4.
	Further information on how impacts will be minimised is included in sections 3.1.6.2, 3.3.4.2, 3.4.4.2, and 3.6.5.2. Furthermore, it should be noted that all appropriate marine licences and permissions, have or will be obtained including a licence application that was submitted to the MMO in February for the debris removal within the HHW SAC, which employs mitigation that has been developed by the BSG (detailed in sections 3.3.4 and 3.3.4.2). Seabed within the HHW SAC is comprised of sediment

	based habitats and does not support other non-annex 1 reefs. During consultation with the BSG at meeting BSG 2 (held 2 August 2022) it was confirmed that there are no other reef features within the area from which debris removal will occur and therefore this was not considered further. A slide from the presentation used during that meeting is provided below (Figure 1). Furthermore, as can been seen in Appendix 2 of Annex 2 of the agreement log, Natural England agreed the locations for the areas of search.
The programme of works contained within the BIMP does not include a programme of works that will ensure that 8.3 hectares of marine debris will have been removed prior to the commencement of cable installation works.	A new programme of works has been included in section 3.7 of this BIMP which demonstrates how and when The Norfolk Projects will remove 8.3ha (or 10.7ha for both projects in-combination, see Annex 12 for detail) worth of marine debris. The programme demonstrates that this would be achieved prior to cable installation.
The Secretary of State considers that the success criteria within the BIMP are insufficiently precise to be confident that they have been appropriately discharged. The Secretary of State considers that the adaptive management proposals within the BIMP do not meet the requirements contained within the DCOs. The current proposal to discontinue attempts for marine debris recovery if less than 30% of 8.3 hectares is retrieved does not comply with the requirements of the DCO to ensure that 8.3 hectares of marine debris has been removed for each project.	The success criteria, which is detailed in section 3.8, has been changed to ensure that 10.7ha of marine debris will be removed prior to cable installation. Measures for adaptive management have also been included in sections 3.9.
The Secretary of State notes that some details have been provided relating to how impacts to protected reef habits within designated sites will be avoided. However, it is noted that whilst debris "within the vicinity" of previously unidentified Annex I Sabellaria reef would not be removed, this term is not quantified, so it is unclear how far this extends.	This will be achieved by not removing debris targets should they be within 50m of any Sabellaria reef. The ROV will fly three transects of 100m with the target in the centre thus exploring in six different directions and if Sabellaria reef is identified, the target will be abandoned. Further information is provided in section 3.1.6
The Secretary of State has not identified any details of the locations for the disposal	Preliminary areas have been identified for disposal of material dredged from within

of dredged material, nor evidence that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features.	the HHW SAC for the purposes of cable installation. Detail on these locations is provided in section 5.3. The MMO is required to approve the final disposal locations as part of the HHW SAC Cable Specification Implementation and Monitoring Plan. The commitments to ensure that the disposal mechanism will allow sediment to be retained within the sandbank system and avoid impacts to other features are secured through the In principle HHW SAC CSIMP document (application Document Reference 8.20). These are repeated in section 5.3 of this document and will guarantee that the dredged sediment will remain within the system. However the precise details, such as the exact type of fall pipe used, the speed of vessel when ejecting sediment etc. will be agreed and secured through the consultation on and discharge of the HHW SAC CSIMP document in 2026, when the most up to date information is available on where the Sabellaria reef is located and the vessels and tools for cable installation have been procured.

Primary Area of Search = A5.27: Deep circalittoral sand

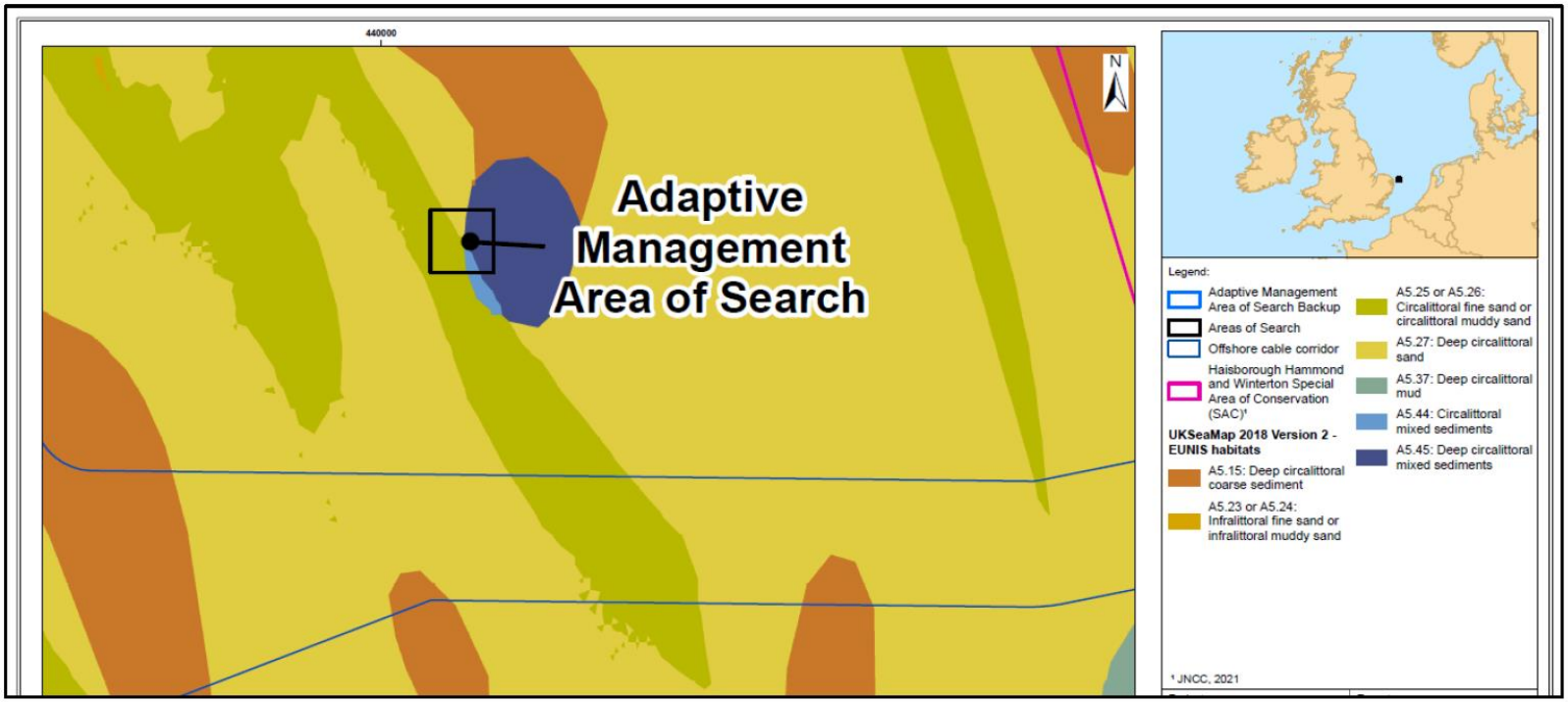


Figure 1 slide presented during BSG meeting 2 to highlight that the areas of search for marine debris comprise sediment habitats with no reef features present.

ANNEX 6 GHOST FISHING UK AND LETTER OF INTENT

This Annex contains a signed letter of intent as evidence of Ghost Fishing UK's willingness to collaborate with The Norfolk Projects and deliver the scope of works described in section 3.3 of the BIMP.

GHOST FISHING UK

[redacted]

Dear Mr Ruari Lean,

I am writing to you on behalf of Ghost Fishing UK to confirm that, should the Secretary of State for the UK's Department for Energy Security and Net Zero approve version 2 of the Benthic Implementation and Monitoring Plan (BIMP), Ghost Fishing UK would accept your proposal to collaborate on the removal of marine debris. Upon BIMP approval we would enter into a contract with Norfolk Vanguard Limited, Norfolk Vanguard West Limited and Norfolk Boreas Limited (herein referred to as the Norfolk Projects) to secure the funding for eight planned Debris removal campaigns and two emergency or ad-hoc in 2024.

We can confirm that Ghost Fishing UK has been working with the Norfolk Projects to identify appropriate locations for operations which could be funded by the Norfolk Projects and agree the content of your proposal document which we understand will be submitted in support of your BIMP approval application. We can also confirm that we have provided information which has been used in the BIMP document itself.

Ghost Fishing UK understand that upon approval of the BIMP and contract agreement being made Ghost Fishing UK would be obliged to attempt to remove the quantities of debris from the locations detailed within your proposal, however the funding would not be reliant on that quantity of debris being removed.

Ghost Fishing UK also understand that should the success criteria of removing 10.7 ha (by a combination of Ghost Fishing UK operations and those of other work streams being proposed in the BIMP) not be met there would be opportunities for future collaboration with The Norfolk Projects in 2025 to undertake further debris removal work (termed adaptive management in the BIMP). Ghost Fishing UK would, in principle, support further collaboration with the Norfolk Projects providing the intended collaboration during 2024 had been beneficial to both parties.

I look forward to future collaboration with the Norfolk Projects,

Yours sincerely

[redacted]

Rich Walker

Ghost Fishing UK

Richard Walker - [redacted]

ANNEX 7 DIVE THE NORTH SEA CLEAN AND LETTER OF INTENT.

This Annex contains a signed letter of intent as evidence of DDNZS's willingness to collaborate with The Norfolk Projects and deliver the scope of works described in section 3.4 of the BIMP.

Your reference: PB5640.008.0107

Poeldijk, 2 February 2024

Dear Mr Ruari Lean,

On behalf of Stichting Duik de Noordzee Schoon I confirm that, subject to the Secretary of State of the UK Department for Energy Security and Net Zero approving version 2 of the Benthic Implementation and Monitoring Plan (BIMP), Stichting Duik de Noordzee Schoon (herein referred to as SDDNZS) will accept your proposal to cooperate on the removal of marine debris.
Upon BIMP's approval Norfolk Vanguard Limited, Norfolk Vanguard West Limited and Norfolk Boreas Limited (herein referred to as the Norfolk Projects) agree to secure the funding for two debris removal expeditions in 2024 by a donation. One expedition to the Brown Bank and one in the Southern part of the North Sea between Belgium and France.

We confirm that SDDNZS has been working together with the Norfolk Projects to identify appropriate locations for the debris removal operations. Norfolk Projects will fund the SDDNZS cleanup campaign with a donation. SDDNZS agrees with the content of your proposal document, which we understand will be submitted in support of your BIMP approval application. We confirm that we have provided information which has been used in the BIMP document itself.

SDDNZS understands that upon approval of the BIMP and contract agreement being made SDDNSZ will attempt on best effort but not guarantee to remove the quantities of debris from the locations detailed within your proposal. The funding of SDDNZS shall not be reliant on the quantity of debris being removed.

SDDNZS also understands that if the success criteria of removing 10.7 ha (by a combination of SDDNZS activities and those of other work streams being proposed in the BIMP) not be met, there will be opportunities for future cooperation with The Norfolk Projects in 2025 to undertake additional debris removal activities (termed "adaptive management in the BIMP"). SDDNZS will, in principle, support further cooperation with the Norfolk Projects, providing the intended cooperation during 2024 will benefit both parties without any obligation for either party.

Yours sincerely,

[redacted]

B. Stiefelhagen
Chairman Stichting Duik de Noordzee Schoon

[redacted]

ANNEX 8 NORFOLK BEACH CLEANS LETTER OF INTENT

This Annex contains a signed letter of intent as evidence of NBC's willingness to collaborate with The Norfolk Projects and deliver the scope of works described in section 3.5 of the BIMP.

Norfolk Beach Cleans

[redacted]

January 30th, 2024

Dear Mr Ruari Lean,

I am writing to you on behalf of Norfolk Beach Cleans (NBC) to confirm that, should the Secretary of State for the UKs Department for Energy Security and Net Zero approve version 2 of the Benthic Implementation and Monitoring Plan (BIMP), NBC plan to accept your proposal to collaborate on the removal of beach litter from the Norfolk and Suffolk coast. Upon BIMP approval we would enter into a contract with Norfolk Vanguard Limited, Norfolk Vanguard West Limited and Norfolk Boreas Limited (herein referred to as the Norfolk Projects) to secure the funding for a yearlong beach clean campaign to remove the target weight of beach litter outlined in the proposal.

We can confirm that NBC has been working with the Norfolk Projects to identify appropriate locations for beach clean operations which could be funded by the Norfolk Projects and are in agreement with the content of your proposal document which we understand will be submitted in support of your BIMP version 2 approval application.

NBC understand that upon approval from the Secretary of State of the BIMP and upon the contract agreement being made, NBC would be obliged to start working towards the removal of the quantities of beach litter detailed within the proposal. NBC also understand that the funding would not be reliant on that quantity of debris being removed.

NBC also understand that should the success criteria of removing 10.7 ha (by a combination of NBC operations and those of other work streams being proposed in the BIMP) not be met, then there would be opportunities for future collaboration with The Norfolk Projects in 2025 to undertake further beach litter removal work (termed “adaptive management” in the BIMP). NBC hereby state our in principle interest for further collaboration with the Norfolk Projects providing the intended collaboration during the 2024 outlined in this proposal had been beneficial to both parties.

Yours sincerely

[redacted]

Emma Sturman
Norfolk Beach Cleans CIC

ANNEX 9 KEEP BRITIAN TIDY LETTER OF INTENT

This Annex contains a signed letter of intent as evidence of KBT's willingness to collaborate with The Norfolk Projects and deliver the scope of works described in section 3.5 of the BIMP.

Rauri Lean
Vattenfall
70 St Mary Axe,
London
EC3A 8BE

31 January 2024

Dear Mr Ruari Lean,

I am writing to you on behalf of Keep Britain Tidy (KBT) to confirm that, should the Secretary of State for the UKs Department for Energy Security and Net Zero approve version 2 of the Benthic Implementation and Monitoring Plan (BIMP), KBT plan to accept your proposal to collaborate on the removal of beach litter from the Lincolnshire, Norfolk, Suffolk and Essex coasts.

As agreed, upon BIMP approval we will receive a donation from Norfolk Vanguard Limited, Norfolk Vanguard West Limited and Norfolk Boreas Limited (herein referred to as the Norfolk Projects) toward supporting a yearlong beach clean campaign to remove the (non-binding) target weight of beach litter outlined in the proposal.

We can confirm that KBT has been working with the Norfolk Projects to identify appropriate locations for beach clean operations which could be funded by the Norfolk Projects and agree with the content of your proposal document which we understand will be submitted in support of your BIMP version 2 approval application.

KBT understand that upon approval from the Secretary of State of the BIMP and upon the donation agreement being made, KBT would be obliged to start working towards the removal of the quantities of beach litter detailed within the proposal. KBT understand that the funding would not be reliant on that quantity of debris being removed.

KBT also understand that should the success criteria of removing 10.7 ha (by a combination of KBT operations and those of other work streams being proposed in the BIMP) not be met, then there would be opportunities for future collaboration with The Norfolk Projects in 2025 to undertake further beach litter removal work (termed “adaptive management” in the BIMP). KBT hereby state our in-principle interest for further collaboration with the Norfolk Projects, providing the intended collaboration during the 2024 outlined in this proposal had been beneficial to both parties.

Yours sincerely

[redacted]

Andrea Crump
Chief Operating Officer
Keep Britain Tidy

[redacted]

ANNEX 10 THE OCEAN CLEANUP LETTER OF INTENT

This Annex contains a signed letter of intent as evidence of The Ocean Cleanup's willingness to collaborate with The Norfolk Projects and deliver the scope of works described in section 3.6 of the BIMP.

THE OCEAN CLEANUP

January 30, 2024

RE: Letter of Intent to Collaborate on the Removal of Marine Debris

Dear Mr. Ruari Lean,

The Ocean Cleanup would like to sign this letter of intent to confirm that, upon approval of the Benthic Implementation and Monitoring Plan (hereinafter "**BIMP**") by the Secretary of State for the U.K. Department for Energy Security and Net Zero, we would continue working towards a collaboration of the removal of marine debris as introduced in your proposal (hereinafter "**Project Proposal**"). We appreciate the time and energy our teams have afforded in discussing this opportunity and the information that has been provided thus far.

Under the Project Proposal, the BIMP will be submitted in March 2024. Thereafter, upon approval of the BIMP (anticipated to occur in or around May 2024), The Ocean Cleanup would enter into a contract with Norfolk Vanguard Limited, Norfolk Vanguard West Limited and Norfolk Boreas Limited (hereinafter "**Norfolk Projects**") to secure funding for the removal of marine debris from the sea surface. The Ocean Cleanup has been working with Norfolk Projects to identify appropriate locations for its operations – specifically the Great Pacific Garbage Patch located between Hawaii and the west coast of California in the United States – as well as methods of debris removal and other information that has been used in the BIMP application itself.

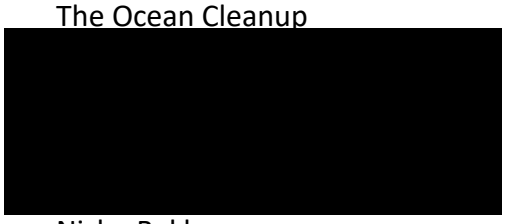
Upon execution of a contract agreement between The Ocean Cleanup and Norfolk Projects, The Ocean Cleanup would work to facilitate the removal of 39,725 kg of marine debris, with Norfolk Projects providing the necessary funding. In the event The Norfolk Projects is unable to remove its required 10.7 ha (required under its Licence) of marine debris through a combination of The Ocean Cleanup operations and other work streams as provided for in the BIMP, The Ocean Cleanup understands there would still be opportunities for future collaboration with Norfolk Projects to undertake further debris removal work (or "adaptive

management" as referenced in the BIMP). Provided the intended collaboration detailed in the Project Proposal is beneficial to both parties, The Ocean Cleanup would, in principle, support further collaboration with Norfolk Projects.

While we look forward to a successful collaboration with the Norfolk Projects under the Project Proposal, please understand that this letter of intent is not enforceable by either Norfolk Projects or The Ocean Cleanup. The terms outlined above are solely for the purposes of reaching an agreement at a later date, of which neither The Ocean Cleanup or Norfolk Projects are bound.

Yours sincerely,

The Ocean Cleanup



Nisha Bakker

Director Partnerships

ANNEX 11 CALCULATING THE AREA OF A NET AND CONVERTING ITS WEIGHT TO AN AREA

343. In order to convert the weight of a net to an area of impact, the total area of a typical net is calculated and from this the weight (in kg) of each m^2 of the net can be derived. The calculations presented below can be undertaken to establish this.

344. Nets are described as follows:

- A number such as *3mm* is provided: This is the diameter of the monofilament the net is made from, in this case 3mm diameter filament.
- A value such as *82mm inside mesh* is provided. This is the stretched mesh measurement from the top of the diamond to the bottom or from side to side.
- A figure such as *125MD* is also provided. This is how many meshes deep the net is. This along with the inside mesh value determines the height of the net.
- A figure such as *100ML* describes how many meshes long the net is. This along with the inside mesh value determines the length of the net.
- Bales of net are usually sold in measurements of MD and ML, in other words: meshes deep and meshes long. So, it is necessary to convert from MD and ML to metres using the known mesh size.
- A weight is also proved for each net for example 5.12kg

345. Using the example above the following would then be calculated.

Mesh depth is 125MD/(82/1000) = 10.25m
Mesh Length is 100ML/(82/1000) = 8.20m
Mesh Area is 10.25×8.20 = 84.05
Meters squared (m^2) per kilogram (kg) of weight is therefore
5.12kg/84.05m^2 = **0.061kg/m^2**

346. For the Bass/ Mullet net and monofilament net Advanced Netting were contacted by phone to provide a weight for that specific net as it was not available on their website

ANNEX 12 PAPER PRESENTING THE CASE THAT 10.7HA OF DEBRIS REMOVAL IS REQUIRED.

VATTENFALL NORFOLK PROJECTS

BENTHIC COMPENSATION QUANTITIES

1. SUMMARY

1.1 This paper considers the appropriate quantum of marine debris to be removed on an in-combination basis across each of the Norfolk Vanguard Offshore Wind Farm Order 2022 (SI 2022 No. 138) (**NV DCO**) and the Norfolk Boreas Offshore Wind Farm Order 2021 (SI 2021 No. 1414) (**NB DCO**).

1.2 It concludes that removal of 10.7 ha of marine debris, would achieve appropriate compensation for the Haisborough, Hammond and Winterton Special Area of Conservation (**HHW SAC**) in accordance with the Secretary of State's conclusions in the Appropriate Assessments dated February 2022 (NB DCO) and December 2021 (NV DCO) as well as comply with the requirement to deliver *no less* than 8.3 ha of marine debris removal under the NB DCO and *up to* 8.3 ha of marine debris under the NV DCO as set out in Schedules 19 and 17 of the DCOs respectively.

2. DCO WORDING

2.1 Condition 29 of Part 3 of Schedule 19 to the NB DCO reads as follows (our emphasis):

> *The BIMP must include in particular:*
>
> *(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****;*
>
> *(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;*
>
> *(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 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;*
>
> *(h) details of how all impacts to protected reef habitats within the HHW SAC will be avoided where possible; 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.* (emphasis added)

2.2 Condition 29 of Part 3 of Schedule 17 to the NV DCO reads as follows (our emphasis):

The BIMP must include in particular:

(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 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;

(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;

(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 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;

(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. (emphasis added)

2.3 This wording allows for an in-combination consideration of compensation to be delivered under both the NB DCO and NV DCO in the event that:

2.3.1 Marine debris removal is delivered under both the NB DCO and the NV DCO; and

2.3.2 Impact on the HHW SAC is shared by virtue of the shared cable corridor.

2.4 As a single Benthic Implementation and Monitoring Plan is being prepared jointly for the NV and NB DCOs, both of these conditions are satisfied.

2.5 Accordingly, the NB DCO allows for the quantum of marine debris removal, to be delivered in respect of disturbance to reef habitats in the Haisborough, Hammond and Winterton Special Area of Conservation under the NB DCO, to be reduced by the amount of marine debris removal to be delivered for this same impact under the NV DCO. This is due to their being a shared impact by virtue of the shared cable corridor.

2.6 This is explained in the Secretary of State's Appropriate Assessments dated February 2022 (NB DCO) and December 2021 (NV DCO) as set out below.

3. HABITATS REGUALTIONS ASSESSMENTS

3.1 Paragraph 12.3 of the Secretary of State's Habitats Regulation Assessment (HRA) for the NB DCO[1] states as follows (our emphasis):

> *…It is estimated that under the **worst-case scenario 5.9 ha of reefs within the SAC could be disturbed by cable installation and a further 2.4 ha of SAC habitats could be lost to cable protection.** The compensation measures must therefore compensate for the impacts on a total of 8.3 ha of benthic habitats. The removal of marine debris will improve the condition of the habitats for the endemic epifaunal communities by exposing the underlying substrates that constitute the benthic ecosystem. This will contribute to the conservation objectives of the SAC by removing artificial materials from the seabed and reducing adverse pressures on the biological assemblages…* (emphasis added)

3.2 Paragraph 12.3 of the Secretary of State's HRA for the NV DCO[2] states as follows (our emphasis):

> *…Therefore, the Project must compensate for **at least 2.4 ha and up to a maximum of 8.3 ha** of benthic habitat. The 8.3 ha total comprises **2.4 ha to compensate for the Project's adverse effects alone upon sandbank habitats**, and **a further 5.9 ha to compensate for the Project's shared adverse effects upon reef habitats with Norfolk Boreas**, unless it can be demonstrated that the compensation delivered for reef habitats through the Norfolk Boreas Development Consent Order has sufficiently compensated for the 5.9 ha impacts of both Projects upon reef habitats in-combination…* (emphasis added)

3.3 Accordingly, each of NV and NB must compensate for 2.4 ha in respect of impacts resulting from cable protection. This results in 4.8 ha of marine debris removal compensation in-combination for cable protection across both DCOs.

3.4 The required quantum of marine debris removal for compensation in respect of the shared impact of disturbance, caused by cable installation by virtue of the shared cable corridor, must be added to this figure. This is a maximum in-combination figure of 5.9 hectares. A single figure of 5.9 ha is given for both projects because the cable corridor and therefore the impact, is shared across the two projects. As the full 5.9 ha of compensation for cable installation is being provided under the NB DCO, no further marine debris removal is required for this shared impact under the NB DCO.

3.5 This results in a total compensation requirement of 10.7 ha of marine debris removal being required to fully compensate the HHW SAC for both DCOs, comprising of:

3.5.1 Compensation for cable protection under the NV DCO – 2.4 ha; **plus**

3.5.2 Compensation for cable protection under the NB DCO – 2.4 ha; **plus**

3.5.3 Compensation for cable installation for the shared impact in respect of the shared cable corridor under the NV and NB DCOs – 5.9 ha.

4. CONCLUSON

4.1 As was intended following the reasoning provided within the NV DCO HRA, the NV DCO compensation provisions included at paragraph 29(b) of Part 3 to Schedule 17 allow for the quantum of marine debris removal required to compensate for impacts on the HHW SAC to be calculated with regard to the shared in-combination effects of cable installation across both

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002919-NORB-Habitats-Regulations-Assessment.pdf
[2] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-004461-NORV-Habitats-Regulations-Assessment-FINAL.pdf

projects, such that the total quantum of marine debris removal required across both DCOs is 10.7 ha and not 16.6 ha.

WOMBLE BOND DICKINSON (UK) LLP

10 JANUARY 2024