Marine Management Organisation

MMO Stage 3 Site Assessment: Offshore Brighton MPA (DRAFT)

...ambitious for our seas and coasts

Title: MMO Stage 3 Site Assessment: Offshore Brighton MPA DRAFT

Contents

Contents 1

Executive Summary 1

1 Introduction 2

2 Site information 3

3 Part A - Identified pressures on the MPA 7

4 Part B - Fishing activity assessment 13

5 Part C - In-combination assessment 26

6 Conclusion and proposed management 30

7 Review of this assessment 32

References 33

Annexes 37

Executive Summary

This assessment analyses the impact of anchored nets and lines, bottom towed gears and traps on the designated features high energy circalittoral rock, subtidal coarse sediment and subtidal mixed sediments in Offshore Brighton Marine Protected Area (MPA) to determine whether a significant risk of hindering the conservation objectives of the site can be excluded. The assessment sets out the evidence considered and analyses the quality of that evidence.

The assessment finds that the ongoing use of anchored nets and lines and traps will not result in a significant risk of hindering the achievement of the conservation objectives of the MPA. Management measures will not therefore be implemented for anchored nets and lines and traps for Offshore Brighton MPA. However, there is a significant risk of the ongoing use of bottom towed gears hindering the achievement of the conservation objectives of the MPA. Management measures will therefore be implemented for bottom towed gears. **Section 6** contains further details of these measures.

1 Introduction

This assessment considers whether fishing activities are compatible with the conservation objectives of Offshore Brighton MPA.

This site is designated as a marine conservation zone (MCZ). This assessment uses the best available evidence to review site characteristics and fishing activity and determine if there is a significant risk of fishing activities hindering the conservation objectives of the site. If so, MMO will develop and introduce suitable management measures, such as MMO byelaws. If MMO byelaws are required, then these will be subject to public consultation and will require confirmation from the Secretary of State to come into effect.

2 Site information

2.1 Overview

The following Joint Nature Conservation Committee (JNCC) site information and Department for Environment Food and Rural Affairs (Defra) factsheet were used for background on site geography, designations, features, conservation objectives and general management approaches:

- JNCC Site Information - Offshore Brighton MCZ[1]
- Defra Factsheet - Offshore Brighton MCZ[2]

Offshore Brighton MPA is located in the eastern English Channel, 45 km south of Selsey Bill, West Sussex. The site is beyond the 12 nautical mile (nm) limits and covers an area of approximately 862 km^2 (**Figure 1**). Fishing activity in the site is regulated by MMO. JNCC is the relevant Statutory Nature Conservation Body for the site. Dolphin Head Highly Protected Marine Area (HPMA) partially overlaps with Offshore Brighton MPA, this overlapping area is approximately 282 km^2 in size and represents 32.7% of the total area of Offshore Brighton MPA.

Offshore Brighton MPA was designated as a marine conservation zone (MCZ) in 2016. The designated features and their general management approaches are set out below in **Table 1**.

The seabed in the MPA is comprised of three Broad Scale Habitats: subtidal coarse sediment, subtidal mixed sediments and high-energy circalittoral rock. Subtidal coarse sediment is the most widespread feature in the site, occupying approximately 58% of the total extent of the site and located mainly in the western area. Subtidal mixed sediments are found in the eastern part of the site and occupies approximately 27 % of the total site extent. High-energy circalittoral rock is exposed where a tributary channel system merges with the deeper paleo-valley in the northwest of the site and occupies approximately 15% of the total site extent.

The site survey undertaken in 2012 identified a broad diversity of species as being present, with 167 infauna and 63 epifaunal species recorded. The habitats within the site support a diverse community particularly rich in polychaetes (worms), venerid bivalve, hornwrack (*Flustra foliacea*), the hydroid (*Hydrallmania falcata*) and brittlestars (*Orphiothrix fragilis*) and/or (*Ophiocomina nigra*).

[1] https://jncc.gov.uk/our-work/offshore-brighton-mpa/ (last accessed 4 October 2023)
[2] https://www.gov.uk/government/publications/marine-conservation-zones-offshore-brighton (last accessed 4 October 2023)

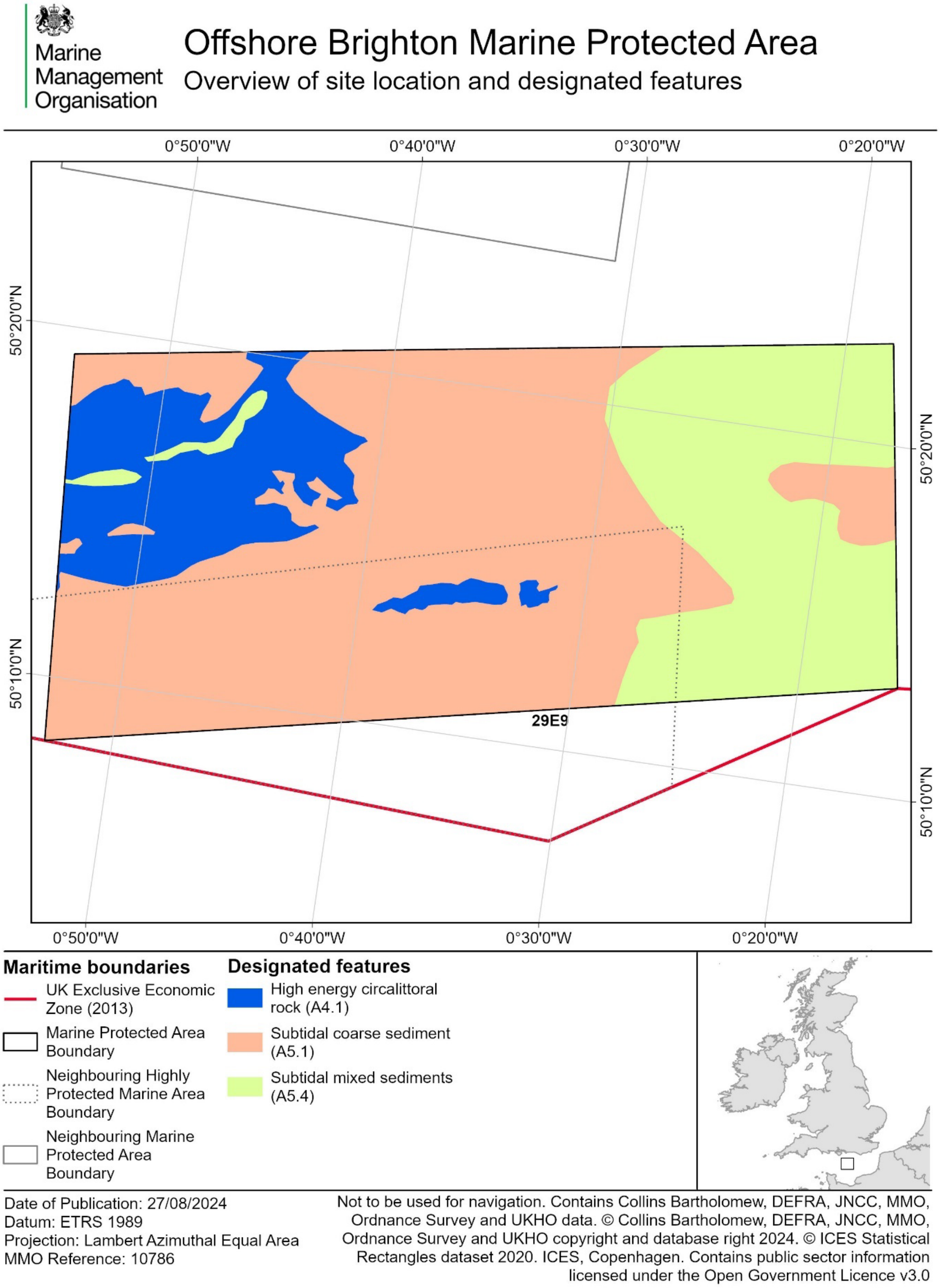

Figure 1: Site overview map.

The general management approaches for the features of Offshore Brighton MPA are based on a vulnerability assessment. As well as bottom towed gear exerting pressures in the site, high density navigation routes and ferry routes take place within the site. In addition, telecommunications and power cables pass through the site.

There is no feature condition assessment available for this site; in its absence a vulnerability assessment, which includes sensitivity and exposure information for features and activities in a site, is used as a proxy for condition. The favourable condition targets for the attributes listed in **Table 1** for the site features have been set as recover due to their high sensitivity to pressures from bottom towed gear.

Table 1: Designated features, including supporting habitats, and general management approaches.

Designated feature	General management approach
High energy circalittoral rock	**Recover to favourable condition**
Subtidal coarse sediment	Favourable condition in this context means the:
Subtidal mixed sediments	• extent is stable or increasing; and • structures and functions, its quality, and the composition of its characteristic biological communities are such as to ensure that it is in a condition which is healthy and not deteriorating.

2.2 Scope of this assessment

The scope of this assessment covers fishing activities alone, and relevant activities in combination with fishing.

Bottom towed gear interactions with the high energy circalittoral rock feature have not been included in this assessment as they have already been addressed in the MMO Stage 2 assessment of Offshore Brighton MPA[3] and prohibited by the MMO Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023[4]. Stage 2

[3] Stage 2 MPA Fisheries Assessment of Offshore Brighton MPA: assets.publishing.service.gov.uk/media/65bb6d583e26be0011e47e23/Stage_2_MPA_Fisheries_Assessment.pdf

[4] MMO Marine Protected Areas Bottom Towed Fishing Byelaw 2023: www.gov.uk/government/publications/marine-protected-areas-bottom-towed-fishing-gear-byelaw-2023

assessed the impacts of fishing using bottom towed gears on rock and rocky and biogenic reef in 13 MPAs.

Dolphin Head Highly Protected Marine Area (HPMA) partially overlaps with Offshore Brighton MPA and where this overlap occurs, the conservation advice for Dolphin Head HPMA[5] supersedes that published for Offshore Brighton MPA.

[5] Dolphin Head HPMA conservation advice: https://jncc.gov.uk/our-work/dolphin-head-hpma/ (last accessed 25 June 2024)

3 Part A - Identified pressures on the MPA

Part A of this assessment was carried out in a manner that is consistent with the ‘capable of affecting (other than insignificantly)’ test required by section 126 of the Marine and Coastal Access Act 2009[6].

Part A assesses the interactions between pressures from fishing gears and the designated features of this site, screening for interactions that require further consideration. Assessment of interactions not screened out in Part A will form Part B of the assessment. For each activity assessed in Part A, there are two possible outcomes for each identified pressure-feature interaction:

1. The pressure-feature interactions **are not** included for assessment in Part B and screened out:
    a. if the feature is not exposed to the pressure, and is not likely to be in the future;
    b. the pressure is not capable of affecting the feature, other than insignificantly; or
    c. if MMO has information that the activity or pressure is not occurring in the site and/or does not need to be considered further.

2. The pressure-feature interactions **are** included for assessment in Part B:
    a. if the feature is exposed to the pressure, or is likely to be in the future;
    b. the pressure is capable of affecting the feature, other than insignificantly;
    c. if it is not possible to determine whether the pressure is capable of affecting the feature, other than insignificantly; or
    d. if MMO has information that the activity or pressure is occurring in the site and/or does need to be considered further.

Consideration of a pressure on a protected feature in an MPA includes consideration of the pressure’s exposure to, or effect on, any ecological or geomorphological process on which the conservation of the protected feature is wholly or in part dependent.

3.1 Activities taking place

Table 2 lists all commercial fishing gears included for assessment. All other gears have been screened out of further assessment as they do not take place and are not likely to take place in the future, as there are no vessel monitoring system (VMS) records present within the site linked to these gear codes, nor do they appear in landings data for International Council for the Exploration of the Sea (ICES) statistical rectangles that overlap the site.

[6] www.legislation.gov.uk/ukpga/2009/23/section/126

To determine fishing activity occurring within the site, the following evidence sources were used:

- VMS data;
- fisheries landings data (logbooks and sales records);
- MMO catch recording project data;
- ICES rectangle level fishing effort data in days (reference: MMO1264);
- swept area ratio (SAR) data.

For more information about the above evidence sources, please see the Stage 3 MPA Site Assessment Methodology document[7], which describes each type of fishing activity evidence and summarises the strengths and limitations of each source.

Table 2: Fishing activities covered by this assessment present in VMS and landings data for Offshore Brighton MPA, 2016 to 2021.

<table>
<tr><th>Gear type</th><th>Gear name</th><th>Gear code</th><th>Justification</th></tr>
<tr><td rowspan="5">Anchored nets and lines</td><td>Trammel net</td><td>GTR</td><td rowspan="2">Present in VMS records and in under 12 m vessel landings data for ICES statistical rectangles that overlap the site.</td></tr>
<tr><td>Longlines (demersal)</td><td>LLS</td></tr>
<tr><td>Set gillnet (anchored)</td><td>GNS</td><td rowspan="3">Present in under 12 m vessel landings data for ICES statistical rectangles that overlap the site.</td></tr>
<tr><td>Gill nets (not specified)</td><td>GN</td></tr>
<tr><td>Combined gillnet-trammel net</td><td>GTN</td></tr>
<tr><td rowspan="8">Bottom towed gear</td><td>Twin bottom otter trawl</td><td>OTT</td><td rowspan="4">Present in VMS data.</td></tr>
<tr><td>Pair seine</td><td>SPR</td></tr>
<tr><td>Danish / anchor seine</td><td>SDN</td></tr>
<tr><td>Seine (unspecified)</td><td>SX</td></tr>
<tr><td>Towed dredge</td><td>DRB</td><td rowspan="4">Present in VMS records and in under 12 m vessel landings data for ICES statistical rectangles that overlap the site.</td></tr>
<tr><td>Scottish / fly seine</td><td>SSC</td></tr>
<tr><td>Bottom otter trawl</td><td>OTB</td></tr>
<tr><td>Beam trawl</td><td>TBB</td></tr>
</table>

[7] Stage 3 MPA Site Assessment Methodology document: www.gov.uk/government/publications/stage-3-site-assessments (last accessed 13 September 2024)

Gear type	Gear name	Gear code	Justification
	Otter trawls (unspecified)	OT	Present in under 12 m vessel landings data for ICES statistical rectangles that overlap the site.
Gear type	**Gear name**	**Gear code**	**Justification**
Midwater gear	Midwater pair trawl	PTM	Present in VMS data.
	Midwater otter trawl	OTM	
	Hook and line (unspecified)	LX	Present in under 12 m vessel landings data for ICES statistical rectangles that overlap the site.
	Hand-operated pole-and-line	LHP	
Miscellaneous	Not Known	NK	
Traps	Pot/Creel	FPO	Present in VMS records and in under 12 m vessel landings data for ICES statistical rectangles that overlap the site.

3.2 Pressures, features and activities screened out

This section identifies activities or pressures that are **occurring but do not need to be considered** for Offshore Brighton MPA.

The gear types and pressures screened out on this basis are listed below with justification:

- **Bottom towed gear interactions with the feature High Energy Circalittoral Rock:** These interactions have not been included in this assessment as they have already been addressed in the Stage 2 assessment of Offshore Brighton MPA[3]. Stage 2 assessed the impacts of fishing using bottom towed gears on rock, rocky and biogenic reef in 13 MPAs. These features were chosen for Stage 2 as they are some of the most sensitive to the impacts of bottom towed gears.
- **Midwater gears:** although the use of midwater gears does occur within Offshore Brighton MPA, there is no feasible pathway for gears of this type to interact with benthic designated features as part of normal operation (not considering gear failure or net loss). These gears are not designed to operate on or near the seabed and are deployed entirely within the water column. Therefore, the use of midwater gear within Offshore Brighton MPA is not considered to be capable of affecting the designated features other than insignificantly and is not considered further within this assessment.
- **Unknown gear:** ‘other gear’ or 'miscellaneous gear' has been declared as having been used to land fish from this ICES statistical rectangle. The gear code used to report these landings does not provide any further information

relating to the fishing method used. It is therefore not possible to assess the likelihood of this fishing method interacting with the seabed and it is not considered further within this assessment.

3.3 Pressures to be taken forward to Part B

The Stage 3 Fishing Gear MPA Impacts Evidence documents detail all pressures created by fishing activity on features of interest. The documents justify which pressures should be taken forward for consideration for each feature. This is documented in Table A1.2 in the anchored nets and lines, bottom towed gear and traps Impacts Evidence documents:

- Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines[8];
- Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear[9]; and
- Stage 3 Fishing Gear MPA Impacts Evidence Traps[10].

Bottom towed gear interactions with the feature high energy circalittoral rock has not been included in this assessment as it has already been addressed in the Stage 2 assessment of Offshore Brighton MPA[3]. Stage 2 assessed the impacts of fishing using bottom towed gears on rock, rocky and biogenic reef in 13 MPAs.

To determine whether a pressure should be taken forward for this particular site, **Table 3** uses the information from the Impacts Evidence documents, alongside site level information, including sensitivity assessments, risk profiling of pressures from conservation advice packages, and JNCC advice to assess the sensitivities of pressures on the designated features of the site.

Table 3 details the pressures for each gear type - anchored nets and lines (A), bottom towed gear (B) and traps (T) - to be assessed in Part B, taking into account the pressures screened in and out in **sections 3.1** and **3.2**.

[8] Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines: www.gov.uk/government/publications/stage-3-impacts-evidence (last accessed 16 September 2024)
[9] Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear: www.gov.uk/government/publications/stage-3-impacts-evidence (last accessed 16 September 2024)
[10] Stage 3 Fishing Gear MPA Impacts Evidence Traps: www.gov.uk/government/publications/stage-3-impacts-evidence (last accessed 16 September 2024)

Key	
	Dark blue highlighting indicates that the feature is sensitive to this pressure from the gear type in this site, and that the interaction should be taken forward for consideration.
	Light blue highlighting indicates that feature is sensitive to the pressure in general, but the gear type is unlikely to exert this pressure to an extent where impacts are of concern in the site.
	Grey highlighting indicates that there is insufficient evidence to make sensitivity conclusions, or that a sensitivity assessment has not been made for this feature to this pressure from the gear type.
	If there is no highlighting within a cell, this indicates that the pressure from the gear type is not relevant to the feature.

Table 3: Sensitivity to potential pressures from fishing activities on designated features.

Potential pressures	Designated features: High energy circalittoral rock		Subtidal coarse sediments			Subtidal mixed sediments		
	A	T	A	B	T	A	B	T
Abrasion or disturbance of the substrate on the surface of the seabed								
Barrier to species movement								
Changes in suspended solids (water clarity)								
Deoxygenation								
Hydrocarbon and polycyclic aromatic hydrocarbon (PAH) contamination								
Introduction of microbial pathogens								
Introduction or spread of invasive non-indigenous species								
Litter								
Organic enrichment								
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion								
Physical change (to another seabed type)								
Removal of non-target species								
Removal of target species								
Smothering and siltation rate changes								
Synthetic compound contamination								
Transition elements and organo-metal contamination								
Underwater noise changes								
Visual disturbance								

4 Part B - Fishing activity assessment

Part B of this assessment was carried out in a manner that is consistent with the 'significant risk of hindering the achievement of the conservation objectives' test required by section 126 of the Marine and Coastal Access Act 2009[11].

Table 3 shows the fishing activities and pressures identified in Part A which have been included for assessment in Part B. The important targets for favourable condition were identified within JNCC's conservation advice and are shown in **Table 4**.

Table 4: Relevant favourable condition targets for identified pressures.

Feature	View of condition and General Management Approach (GMA)	Relevant pressures
High energy circalittoral rock Subtidal coarse sediment Subtidal mixed sediments	The feature is in unfavourable condition. The GMA is to recover the feature to favourable condition.	• Abrasion or disturbance of the substrate on the surface of the seabed • Changes in suspended solids (water clarity) • Smothering and siltation rate changes • Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion • Removal of non-target species • Removal of target species

4.1 Fisheries access and existing management

Non-UK vessels can operate within Offshore Brighton MPA, provided that they have a licence issued by the UK to do so. Nationalities which fished within the MPA include vessels from 2016 to 2021 include UK, Belgium, Germany, Denmark, France, Ireland, Lithuania, the Netherlands, and Norway.

[11] www.legislation.gov.uk/ukpga/2009/23/section/126

VMS records indicate that French vessels are most prevalent. More information on non-UK vessel access to UK waters can be found on MMO's Single Issuing Authority page[12].

Offshore Brighton MPA is subject to the following MMO byelaw:

Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023[4] – prohibiting the use of bottom towed gear within specified areas of the MPA which are to be managed as high energy circalittoral rock.

4.2 Fishing activity summary

Table A1. 1 to **Table A1. 8** in **Annex 1** display a detailed breakdown of fishing activity within Offshore Brighton MPA. When discussing weights from landings in this section, figures used are a total of weights from UK and EU member states.

Of the fishing activities not screened out in **Part A** of this assessment, VMS data show that the most prevalent gear type operated by over 12 m vessels within the site is demersal trawls followed by dredges. Landings data show that the most prevalent gears operated by under 12 m vessels within the site are traps - pots and creels.

Anchored nets and lines

Vessels over 12 m using anchored nets and lines recorded an annual average of 16 VMS records and approximately 3 tonnes (t) of landings and took place predominantly in the central and western portion of the site with little or no variation in the amount of effort applied to the designated features located in those areas of the site Average fishing effort recorded by under 12 m vessels using anchored nets and lines between 2016 and 2021 was 0.29 days per year. Under 12 m vessels within the site landed an average of 0.12 tonnes per year between 2016 and 2020.

Bottom towed gear

The majority of over 12 m bottom towed gear activity in the MPA was from bottom otter trawls (annual average: 2,074 VMS records) with some twin bottom otter trawl and beam trawls (combined annual average: 36 VMS records). Over 12 m vessels deploying demersal trawls operate across the extent of the site, with little or no variation in the amount of effort applied to the designated features of the site, other than particularly high activity recorded in a small portion in the southeast corner of the site. In total, demersal trawls landed on average 107 tonnes (over 12 m vessels 107 tonnes, under 12 m vessels 0.15 tonnes). Under 12 m vessels using bottom towed gear recorded 1 day of fishing. Mean annual surface SAR values for demersal trawl activity for C-squares intersecting Offshore Brighton MPA decreased from a

[12] The UK Single Issuing Authority: www.gov.uk/guidance/united-kingdom-single-issuing-authority-uksia#access-to-uk-and-eu-6-12nm-waters (last accessed 16 September 2024)

peak of 1.52 in 2016 to 1.16 in 2020. Mean annual subsurface SAR values decreased from 0.17 in 2016 to 0.12 in 2020. An SAR value of 1 would mean that on average these C-squares were passed over completely by demersal trawls once every year.

Vessels over 12 m using dredges recorded an annual average of 548 VMS records and approximately 20 tonnes of landings. Over 12 m vessels deploying dredges operate across the extent of the site, with little or no variation in the amount of effort applied to the designated features of the site, other than particularly high activity recorded in a small portion in the northeast corner of the site. Vessels under 12 m using dredges recorded an average of 0.54 days of fishing and approximately 1 tonne of landings per year. Mean annual surface and subsurface SAR values for dredge activity for C-squares intersecting Offshore Brighton MPA decreased from a peak of 0.02 in 2016 to 0.005 in 2020.

Vessels over 12 m using demersal seines recorded an annual average of 77 VMS records and approximately 30 tonnes of landings. Over 12 m vessels deploying demersal seines operate predominantly in the eastern half of the site and along the southern boundary extent, with little or no variation in the amount of effort applied to the designated features located in these areas of the site. Vessels under 12 m using demersal seines recorded an average of approximately 0.63 tonnes of landings per year. No fishing effort data was recorded for demersal seines within the MPA. Mean annual surface SAR values for demersal seine activity for C-squares intersecting Offshore Brighton MPA decreased from a peak of 0.83 in 2016 to 0.14 in 2018, then increased to 0.44 in 2020. Mean annual subsurface SAR values decreased from 0.04 in 2016 to 0.01 in 2018, then increased slightly to 0.02 in 2019 and 2020.

Traps

Trap fishing predominantly occurs in the southeast corner of the site with little or no variation in the amount of effort applied to the designated features located in this area of the site. Vessels over 12 m using traps recorded an annual average of 28 VMS records and approximately 12 tonnes of landings. Vessels under 12 m using traps recorded an average of 7.75 days of fishing effort and approximately 4 tonnes of landings per year.

4.3 Pressures by gear type

The Stage 3 Fishing Gear MPA Impacts Evidence documents for anchored nets and lines, bottom towed gear and traps collate and analyse the best available evidence on the impacts of different fishing gears on MPA features. This section summarises the analyses and conclusions of those documents, and considers these alongside site level information, including the nature and condition of the habitats and species present, the general management approaches for designated features, intensity of fishing activity taking place and exposure to natural disturbance.

As the designated features subtidal coarse sediment and subtidal mixed sediments have similar sensitivities to the pressures identified for different gear types, these features have been considered together. Where there are differences between the features or the potential impacts of different gears within each grouping, this has been highlighted.

In the context of MPA assessment, the pressures removal of target and non-target species refer to any damage, loss, or removal of species defined as a designated feature or integral to the integrity of a designated feature (for example key structural or influential species). This may occur through intentional or unintentional catch associated with the act of commercial fishing. For the purposes of benthic feature assessments, the physical effects of fishing gears on seabed communities are best addressed through the assessment of abrasion and penetration pressures. As there are no designated species features associated with Offshore Brighton MPA, and the detail of key structural and influential species is yet to be fully defined, we conclude that impacts from target and non-target removal pressures can be scoped out from further assessment of this site. These pressures may require consideration as a result of any future evidence review, in conjunction with updated conservation advice from JNCC and Natural England.

4.3.1 Anchored nets and lines

The following features of Offshore Brighton MPA have been considered in relation to pressures from anchored nets and lines.

High energy circalittoral rock, subtidal coarse sediment and subtidal mixed sediments

The relevant pressures on high energy circalittoral rock and the subtidal sediment features of Offshore Brighton MPA from anchored nets and lines were identified in **Table 4** and are:

- abrasion or disturbance of the substrate on the surface of the seabed.

As noted above, impacts from removal of target/non-target species pressures are not being considered in detail in this assessment, as they are assessed more completely within the abrasion pressure.

Impacts on these features relating to abrasion or disturbance of the substrate on the surface of the seabed occur primarily during setting and retrieval of nets and the associated ground lines and anchors, as well as by their movement over the seabed during rough weather.

High energy circalittoral rock

Table A2. 1 of **Annex 2** lists the biotopes that may be found within the high energy circalittoral rock feature of the site. Data has been extracted from the JNCC Biotope

Database to inform this assessment. Biotope sensitivity was then identified from MarLIN for each relevant pressure.

For the circalittoral rock feature, 16 biotopes were identified as potentially being present at the site. As outlined in **Table 5**, one biotope was identified as having high sensitivity to abrasion pressures and six biotopes were identified as having medium sensitivity.

Table 5: High energy circalittoral rock biotopes that may be found within Offshore Brighton MPA with high and medium sensitivity to the abrasion/disturbance of the substrate on the surface of the seabed.

Biotope	Sensitivity
Phakellia ventilabrum and axinellid sponges on deep, wave-exposed circalittoral rock (Readman, Lloyd and Watson, 2023d)	Abrasion: High
Bryozoan turf and erect sponges on tide-swept circalittoral rock (Readman, Lloyd and Watson, 2023a)	Abrasion: Medium
Mixed turf of bryozoans and erect sponges with *Dysidia fragilis* and *Actinothoe sphyrodeta* on tide-swept wave-exposed circalittoral rock (Readman, Lloyd and Watson, 2023c)	Abrasion: Medium
Mixed turf of bryozoans and erect sponges with *Sagartia elegans* on tide-swept circalittoral rock (Readman, Lloyd and Watson, 2023b)	Abrasion: Medium
Sparse sponges, *Nemertesia* spp., and *Alcyonidium diaphanum* on circalittoral mixed substrata (Readman, Lloyd and Watson, 2023f)	Abrasion: Medium
Suberites spp. with a mixed turf of crisiids and *Bugula* spp. on heavily silted moderately wave-exposed shallow circalittoral rock (Readman, Lloyd and Watson, 2023h)	Abrasion: Medium
Sponges and anemones on vertical circalittoral bedrock (Readman, Lloyd and Watson, 2023g)	Abrasion: Medium

As outlined in **Section 4.2**, there is very limited fishing using anchored nets and lines in the MPA.

As described in section 7.1 of the anchored nets and lines Impacts Evidence document[8], sensitivity assessments suggest there is the potential for static gear such as anchored nets and lines to cause damage to rocky reefs and sensitive epifauna. Although targeted research on the impacts of netting on reef is extremely limited, there are some literature reviews that state that high levels of netting and associated anchoring can damage reefs and the associated communities through cumulative damage over time.

The potential for impact will depend on the intensity of fishing activity taking place, with increasing activity increasing the likelihood of weights and ropes associated with nets and lines damaging, entangling or removing epifaunal species. Some studies have also categorised rock with erect and branching spp. as having a high sensitivity to all intensities of fishing with static nets and lines. Epifaunal and epifloral communities' recovery following gill netting activity is not well understood, however, as with other gears, the likely impact of nets and lines on rocky reef will vary based on several factors including gear type, fishing intensity, habitat, and environmental variables. Whilst certain studies have categorised rock with erect and branching spp. as having high sensitivity at all levels of static fishing, these were based on expert judgement rather than supported by empirical evidence and the overarching conclusion from the literature available is that rocky reef features are estimated to have low sensitivity to all but heavy levels of fishing intensity from static fishing gear. Given the low level of anchored nets and lines fishing activity currently occurring within the site, coupled with the spatial footprint of the gear, it is unlikely that the ongoing use of anchored nets and lines over high energy circalittoral rock will pose a significant risk of hindering the achievement of the conservation objective of Offshore Brighton MPA.

Subtidal coarse sediment and subtidal mixed sediments

Table A2. 2 and **Table A2. 3** of **Annex 2** details the list of biotopes that may be found within the sediment features of the site. Data has been extracted from the JNCC Biotope Database to inform this assessment. Biotope sensitivity was then identified from MarLIN for each relevant pressure.

For the subtidal coarse sediment feature, 14 biotopes were identified as potentially being present at the site. Eleven of these biotopes were identified as having low sensitivity to abrasion pressures and three were identified as not being sensitive to abrasion pressures.

For subtidal mixed sediments, five biotopes were identified as having a medium sensitivity to abrasion which may be present within the site and have not been excluded due to depth ranges. These are demonstrated in **Table 6**.

Species associated with the biotopes identified for the site generally have high fecundity rates, reproduce annually and have high dispersal potential, however being a long-lived species, take a relatively long time to reach reproductive maturity.

Table 6: Subtidal mixed sediments' biotopes that may be found within Offshore Brighton MPA with medium sensitivity to the abrasion/disturbance and penetration of the substrate on the surface of the seabed.

Biotope	Sensitivity
Sabella pavonina with sponges and anemones on infralittoral mixed sediment (Perry and Watson, 2023b)	Abrasion: Medium Penetration: Medium
Cerianthus lloydii and other burrowing anemones in circalittoral muddy mixed sediment (Perry and Watson, 2024)	Abrasion: Medium Penetration: Medium
Cerianthus lloydii with *Nemertesia* spp. and other hydroids in circalittoral muddy mixed sediment (Perry and Watson 2023)	Abrasion: Medium Penetration: Medium
Flustra foliacea and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment (Readman and Watson, 2024)	Abrasion: Medium Penetration: Medium
Ophiothrix fragilis and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment (De-Bastos *et al.*, 2023)	Abrasion: Medium Penetration: Medium

As described in section 9.4 of the anchored nets and lines Impacts Evidence document[8], there is limited information on the impacts of static gears on sediment habitats, however available literature suggests that static gears such as anchored nets and lines have a relatively low impact on benthic communities in comparison to bottom towed gears and are likely to be of limited concern to subtidal sediment habitats. Equally, these fishing methods are unlikely to negatively impact the extent or distribution of any sediment feature or structure and function of the ecosystem in a significant manner due to the static nature and relatively small footprint of the gear. Abrasion of the seabed is particularly apparent during hauling of gear or the movement of gear along the seabed when subject to strong tides, currents or storm activity. However, interaction of lines and associated anchors with the seabed is likely to be minimal.

The conclusion from the literature available is that subtidal sediments are estimated to have no or low sensitivity to all but heavy levels of fishing intensity from static fishing on stable species rich sediment habitats or those with long-lived bivalves, however the potential for impact will be dependent on the intensity of fishing activity taking place. Increasing levels of activity increase the likelihood of weights and ropes associated with nets and lines damaging, entangling or removing epifaunal species, in particular those species which are upright and protrude from the sediment and in the case of this site, the presence of species such as *Cerianthus lloydii* which has a low recovery rate following physical disturbance based on long-lifespan and slow growth rate (**Table 6**) (Perry and Watson, 2023a). However, it should be noted that sensitivity to removal via abrasion was predominantly linked to studies using bottom towed gears based on the higher spatial footprint of these gear types, rather than static gear types such as anchored nets and lines.

Given the low level of anchored nets and lines fishing activity currently occurring within the site, coupled with the spatial footprint of the gear, it is unlikely that the ongoing use of anchored nets and lines at the levels described will pose a significant risk of hindering the achievement of the conservation objective of 'recover to favourable condition' of the sediment features of Offshore Brighton MPA.

Therefore, MMO conclude that the ongoing use of anchored nets and lines, at the levels described, does not pose a significant risk of hindering the achievement of the conservation objectives of Offshore Brighton MPA.

4.3.2 Bottom towed gear

The following features of Offshore Brighton MPA have been considered in relation to pressures from bottom towed gear.

Subtidal coarse sediment and subtidal mixed sediments.

The relevant pressures on the subtidal sediment features of Offshore Brighton MPA from bottom towed gear were identified in **Table 4** and are:

- abrasion or disturbance of the substrate on the surface of the seabed*;
- penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion*;
- changes in suspended solids (water clarity) ^;
- smothering and siltation rate changes^.

As noted above, impacts from removal of target/non-target species pressures are not being considered in detail in this assessment, as they are assessed more completely within the abrasion pressure.

Pressures marked with matching superscript symbols (* and ^) have been consolidated in this review to avoid repetition, due to the similar nature of their impacts on sediment habitats.

Abrasion or disturbance and penetration of the substrate on the surface of the seabed

Table 6 in the anchored nets and lines section identifies the subtidal mixed sediments' biotopes with medium sensitivity to both abrasion and penetration pressures. For the subtidal coarse sediment, **Table 7** shows the three additional biotopes that have been identified as having medium sensitivity to penetration pressures.

Table 7: Subtidal coarse sediment biotopes that may be found within Offshore Brighton MPA with medium sensitivity to the abrasion or disturbance and penetration of the substrate on the surface of the seabed.

Biotope	Sensitivity
Hesionura elongata and *Microphthalmus similis* with other interstitial polychaetes in infralittoral mobile coarse sand (Marshall, Ashley and Watson, 2023)	Abrasion: Low Penetration: Medium

Biotope	Sensitivity
Neopentadactyla mixta in circalittoral shell gravel or coarse sand (Tyler-Walters, Durkin and Watson, 2023)	Abrasion: Not sensitive Penetration: Medium
Branchiostoma lanceolatum in circalittoral coarse sand with shell gravel (Tillin and Watson, 2023a)	Abrasion: Low Penetration: Medium

As described in section 8.4.1 of the bottom towed gear Impacts Evidence document[9], abrasion and penetration pressures from bottom towed gear can result in both physical and biological impacts on subtidal sediment features. Physical impacts include the creation of furrows and berms in the sediment from the trawl doors associated with bottom otter trawls; and the flattening of bottom features such as ripples and irregular topography by beam trawls. Physical impacts are unlikely, however, to significantly impact the large-scale topography of sediment features. Of more concern are the impacts to the biological structure of sediment habitats. Impacts to biological communities through damage and mortality of flora and fauna via surface and subsurface abrasion and penetration varies based on the levels of fishing activity and intensity, however the first pass of bottom towed gear over the seabed will remove the most sensitive components of the feature (Hiddink *et al.*, 2006).This can lead to long term shifts in biological communities towards smaller, short-lived, opportunistic species that exhibit greater resilience to anthropogenic activity.

Demersal trawls can cause collision, crushing and uprooting as animals encounter or pass under the gear. Initial reductions in biomass, species richness and diversity, as well as changes in community structure are considered likely to be greatest on subtidal coarse sediments compared to subtidal sand. The first pass of a trawl has the largest initial impact on biomass and production of sediments whereas in areas of high trawling intensity, further increasing trawling intensity can have smaller additional effects on biomass and production. Otter trawls have been found to remove an average of around 6 % of faunal biomass per pass with the first trawl pass having the most significant impact. Large sessile fauna (for example erect sponges, fan corals, hydroids, erect bryozoans) are particularly susceptible to damage, with otter trawling in coarse sediments resulting in considerably reduced abundances of these fauna. Abrasion from dredges can result in direct mortality of species on the seabed, whereas abrasion from demersal trawls can reduce the habitat complexity and can permanently alter the biological community and state of the habitat following periods of high intensity trawling.

Communities in subtidal coarse sediment habitats are particularly sensitive to bottom towed gear activity because they generally contain large proportions of long-lived and more sessile epifauna which are easily damaged or removed by the pass of bottom towed gears leading to reduced diversity, abundance, and occurrences. Recovery may be slow with some research showing that two years after bottom towed gear fishing, the benthic community composition of a mixed coarse substratum area impacted by bottom towed gear was approaching but still not matching the composition of an adjacent area where only static gears were permitted. Communities in gravel habitats are generally considered to be particularly sensitive to bottom towed gear activity, as such habitats contain large proportions of long-lived and more sessile epifauna (Rijnsdorp *et al.*, 2018) which are easily damaged or removed by the pass of bottom towed gears leading to reduced diversity, abundance, and occurrences (Pikesley *et al.*, 2021). Research has shown that, compared with disturbed sites, subtidal coarse sediments undisturbed by bottom towed fishing gears were characterised by an abundance of bushy epifaunal taxa (bryozoans, hydroids, worm tubes) providing complex habitat for shrimp, polychaetes, brittle stars, mussels and small fish and as such had higher numbers of organisms, biomass, species richness and species diversity. Similarly, there is evidence to suggest the recovery of subtidal coarse sediments to disturbance may be longer than softer sediments, with studies demonstrating fragile species as showing no discernible recovery after four months of trawling taking place.

Very little evidence is available regarding the impact of bottom towed gears on subtidal mixed sediments; however, the biological communities are likely vulnerable and more susceptible to surface and subsurface penetration than subtidal sand and subtidal coarse sediments.

Given the high level of bottom towed gear fishing activity currently occurring within the site on these sediment features, coupled with the sensitivity of *Cerianthus lloydii* and other biotopes, in particular those which include sessile or protruding upright species, abrasion and penetration pressures exerted by bottom towed gears operating within Offshore Brighton MPA have the potential to impact biological communities and the overall ecosystem function of the subtidal sediment features found in the site.

It is therefore likely that the ongoing use of bottom towed gear will pose a significant risk of hindering the achievement of the conservation objective of ‘recover to favourable condition’ of the sediment features of Offshore Brighton MPA.

Changes in suspended solids (water clarity) and smothering and siltation rate changes (light)

Table A2. 2 and **Table A2. 3** of **Annex 2** details the list of biotopes that may be found within the sediment features which may be sensitive to the changes in suspended solids (water clarity) and smothering and siltation rate changes pressures.

As outlined in **Table A2. 2** of **Annex 2**, of the 14 biotopes which may be present in the subtidal coarse sediment feature five biotopes were identified as having medium sensitivity to smothering and siltation rate changes. One biotope had medium sensitivity to changes in suspended solids.

As shown in **Table A2. 3** of **Annex 2**, five biotopes potentially present in the subtidal mixed sediments feature were identified as having medium sensitivity to smothering and siltation rate changes.

As described in section 8.4.2 of the bottom towed gear Impacts Evidence document[9], Changes in suspended sediment in the water column may have a range of biological effects on different species within the habitat, affecting their ability to feed or breathe. The impacts on the biological communities of sediment habitats from smothering and siltation as variable depending on the species present. Research used to inform the Impacts Evidence document indicates that sedentary, filter or suspension feeders, such as the species identified in the biotopes with medium sensitivity and low resistance to the pressures described in this section were likely to be impacted most whereas mobile epifauna appear highly resilient and resistant.

Based on the rationale above for the relevant pressures identified, bottom towed gear activity has the potential to impact biological communities, and the overall ecosystem function of the sediment feature found within the site. Given the sensitivity of biotopes identified within the sediment features, low resistance to this type of fishing activity, and slow recoverability, it is likely that the ongoing use of bottom towed gear at the levels described will pose a significant risk of hindering the achievement of the conservation objective of 'recover to favourable condition' of this feature of Offshore Brighton MPA.

Therefore, MMO conclude that the ongoing use of bottom towed gear does pose a significant risk of hindering the achievement of the conservation objectives of Offshore Brighton MPA.

4.3.3 Traps

The following features of Offshore Brighton MPA have been considered in relation to pressures from traps.

High energy circalittoral rock, subtidal coarse sediment and subtidal mixed sediments

The relevant pressures on high energy circalittoral rock and the subtidal sediment features of Offshore Brighton MPA from traps were identified in **Table 4** and are:

- abrasion or disturbance of the substrate on the surface of the seabed.

As noted above, impacts from removal of target/non-target species pressures are not being considered in detail in this assessment, as they are assessed more completely within the abrasion pressure.

Impacts on these features relating to abrasion or disturbance of the substrate on the surface of the seabed occur primarily during the setting and retrieval of traps and their associated ropes, weights and anchors, as well as by their movement over the seabed during rough weather.

High energy circalittoral rock

Traps and anchored nets and lines fishing gear exert similar pressures on the biotopes associated with the high energy circalittoral rock feature of the site, therefore the biotopes identified as having high and medium sensitivity to abrasion in **Table 5** in the anchored nets and lines section also apply here for the traps section. Biotopes with high or medium sensitivity are categorised as sensitive because they include species that protrude from the surface of the feature that could be removed through abrasion (such as bryozoans, sponges, and anemones).

As described in the traps Impacts Evidence document[10], most of the literature before 2015 has suggested that traps are unlikely to significantly impact rocky reef biotopes. However, more recent studies suggest that traps will have negative impacts on the biological functions of reef habitats at increased spatial and temporal densities. Studies show that upright and branching species that protrude from the reef (such as sponges or bryozoans) were found to be particularly vulnerable to damage from the hauling of pots. Repeated trap activity could damage biological communities associated with these biotopes through cumulative impact. However, it should be noted that sensitivity to removal via abrasion was predominantly linked to has generally been addressed in studies using bottom towed gears rather than static gear types such as traps.

Given the low level of trap fishing activity currently occurring within the site, coupled with the small spatial footprint of the gear, it is unlikely that the ongoing use of traps will pose a significant risk of hindering the achievement of the conservation objective of 'recover to favourable condition' of the sediment features of Offshore Brighton MPA.

Subtidal coarse sediment and subtidal mixed sediments

Traps and anchored nets and lines fishing gear exert similar pressures on the biotopes associated with the sediment features of the site, therefore the biotopes identified as having medium sensitivity to abrasion in the anchored nets and lines section also apply here for the traps section.

As described in section 9.4 of the traps Impacts Evidence document[10], there is limited primary evidence on the impacts of static gears on sediment habitats. However, available literature suggests that static gears are unlikely to significantly impact the physical structure of the sediment and have a relatively low impact on benthic communities in comparison to towed gears and are likely to be of limited concern to subtidal sediment habitats. Equally, these fishing methods are unlikely to negatively impact the extent or distribution of any sediment feature or structure and function of the ecosystem in a significant manner due to the static nature and relatively small footprint of the gear. Abrasion of the seabed is particularly apparent during hauling of gear or the movement of gear along the seabed when subject to strong tides, currents or storm activity. However, interaction of lines and associated anchors with the seabed is likely to be minimal. Impacts to biological communities could become a concern if activity reaches a particularly high level of intensity, or particularly sensitive species are present, as there is the potential for the snagging of gear and subsequent entanglement and damage to fragile epifauna as the level of fishing activity and therefore density level of anchors and ropes increases.

The conclusion from the literature available is that subtidal sediments are estimated to have no or low sensitivity to all but heavy levels of fishing intensity from static fishing on stable species rich sediment habitats or those with long-lived bivalves, however the potential for impact will be dependent on the intensity of fishing activity taking place. Increasing levels of activity increase the likelihood of weights and ropes associated with traps damaging, entangling or removing epifaunal species, in particular those species which are upright and protrude from the sediment and in the case of this site, the presence of *Cerianthus lloydii* which has a low recovery rate following physical disturbance based on long-lifespan and slow growth rate.

Given the level of trap fishing activity currently occurring within the site, coupled with the spatial footprint of the gear, it is unlikely that the ongoing use of traps will pose a significant risk of hindering the achievement of the conservation objective of the subtidal sediment features of Offshore Brighton MPA.

Therefore, MMO concludes that the ongoing use of traps, at the levels described, does not pose a significant risk of hindering the achievement of the conservation objectives of Offshore Brighton MPA.

4.4 Part B conclusion

The assessment of anchored nets and lines, bottom towed gears and traps on the high energy circalittoral rock, subtidal coarse sediment and subtidal mixed sediments features of Offshore Brighton MPA has concluded that:

- the ongoing use of anchored nets and lines and traps does not pose a significant risk of hindering the achievement of the conservation objectives of the MPA;
- there is a significant risk of the ongoing use of bottom towed gears hindering the achievement of the conservation objectives of the MPA.

Management measures will therefore be implemented for bottom towed gears. **Section 6** contains further details of these measures.

5 Part C – In-combination assessment

This section assesses the impacts of fishing activities in-combination with relevant activities taking place. This includes the following:

- fishing interactions assessed in Part B but which were not considered, alone, to pose a significant risk of hindering the achievement of the conservation objectives; and
- other activities: such as marine development infrastructure plans and projects that occur in the MPA.

ArcGIS software has been used to check relevant activities that occur within, or adjacent to, the assessed site where there could be a pathway for impact. To determine relevant activities to be included in this part of the assessment, a distance of 5 km was selected as suitable to capture any potential way in which the activity could impact the benthic features of the site in combination with effects of the fishing activities assessed. A 5 km buffer was therefore applied to the site boundary to identify relevant activities. This assessment considers the in-combination impacts of marine licensable activities that are ongoing or upcoming, and with medium to high-risk pressure impact pathways as permitted fishing activity. As the models were run using ArcGIS in August 2023, any licences that ended before this date were screened out of the assessment.

The North Sea Transition Authority (NSTA) is responsible for regulating the oil, gas and carbon storage industries, and as such these activities fall outside of MMO's marine licensing remit. Oil, gas and carbon storage industry activities are not currently considered in this draft assessment, as information on the potential pressures exerted by associated activities is currently under review, and the likelihood of these activities resulting in an in-combination significant risk of hindering the achievement of the site's conservation objectives with fishing is expected to be very low. Following formal consultation, relevant oil, gas and carbon storage industry activities that could impact the site in combination with the effects of assessed fishing activities will be included before finalising this assessment, alongside marine licence applications submitted after August 2023.

There may be active and historic submarine cables within this MPA, these cables are already in-situ and are unlikely to have any residual abrasion/removal pressure in-combination with the assessed fishing activity. Any abrasion/removal pressure from submarine cable operation and maintenance activity will be temporary with limited seabed impacts and is therefore unlikely to have significant in-combination effects with assessed fishing.

Bottom towed gears were identified in Part B as requiring management to avoid posing a significant risk of hindering the achievement of the site conservation objectives. Anchored nets and lines and traps are the only remaining fishing activities occurring within Offshore Brighton MPA that interact with the seabed. In-combination effects of these fishing activities as well as these activities in-combination with other relevant activities will be assessed in this section.

In accordance with the methodology detailed above, ArcGIS identified no other relevant activities occurring within or adjacent to the Offshore Brighton MPA, within the 5 km buffer applied. Therefore, only fishing in-combination with other fishing activities are considered hereafter.

Table 3 from **section 3.3**, was used to identify medium-high risk pressures exerted by fishing which require in-combination assessment (**Table 8**).

Table 8 summarises the pressures exerted by fishing and identifies those pressures exerted by all gears (Y: pressure exerted). Activity-pressure interactions are highlighted dark blue to indicate an in-combination effect. Only fishing activity with no proposed or current fisheries management in place are considered.

Table 8: Pressures exerted by fishing.

	Fishing activities	
Potential pressures	**Anchored nets and lines**	**Traps**
Abrasion or disturbance of the substrate on the surface of the seabed	Y	Y
Removal of non-target species	Y	Y
Removal of target species	Y	Y

5.1 In-combination pressure sections

The fishing pressures exerted by anchored nets and lines and traps will be considered in this section.

5.2 Fishing vs Fishing in-combination pressures

5.2.1 Abrasion and disturbance of the substrate on the surface of the seabed and removal of target and non-target species

As noted in Part B (**Section 4.3.1** nets and lines and **Section 4.3.3** traps), impacts from the removal of target and non-target species pressure is not being considered in detail in this assessment. In-combination impacts from the removal of target and non-target species pressures are more fully assessed under the pressure abrasion, as the detail of key structural and influential species is yet to be fully defined. Therefore, the removal pressures are not considered further in this in-combination assessment. The pressures may require further consideration as future evidence becomes available, in conjunction with updated conservation advice from JNCC and Natural England.

The annual average VMS records for over 12 m vessels within the MPA totalled 28 for traps and 16 for anchored nets and lines. For under 12 m vessels, between 2016 and 2021, the annual average fishing effort estimated to have been derived from the MPA via traps and anchored nets and lines was 8.04 days (7.75 days for traps, 0.29 days for anchored nets and lines, **Annex 1**, calculated from **Table A1. 8**). For the same period (2016-2021), the total fishing effort (under 12s) estimated to have been derived from the MPA were 48.25 days (46.51 days for traps, 1.74 days for anchored nets and lines (**Annex 1**, calculated from **Table A1. 8**). The fishing effort data is further supported by the estimated live weight landings for under 12 m vessels that equal an annual average of 4.41 tonnes, 4.29 tonnes for traps and 0.12 tonnes for anchored nets and lines, between 2016 and 2020 (**Section 4.2**).

The combined impacts from anchored nets and lines and traps could potentially increase the risk of negative effects from the pressure abrasion and disturbance of the substrate on the surface of the seabed. VMS records show that anchored nets and lines activity occurs almost exclusively in the western portion of the site overlapping with an area of circalittoral rock, with one record in the southeastern corner. Trap VMS records are concentrated in the southeastern corner of the site with more sparse recordings extending into the centre and a couple of records in the western portion. As such there may be some overlap between the space use of the two gear types, most likely within the centre and western extent of the MPA. Any potential overlap of effort is likely to occur over high energy circalittoral rock, subtidal coarse sediment, or a small area of subtidal mixed sediments in the west of the site.

While the 6 of the 16 biotopes associated with high energy circalittoral rock have been identified as having medium or high sensitivity to abrasion pressures, this feature is considered to have low or no sensitivity to all but intense fishing from static gear. The sediment features which occur where spatial overlap of the gears may be present, contain 5 biotopes with medium sensitivity to abrasion pressures. However, the impacts of static gear on sediment habitats are considered to be relatively low in comparison to bottom towed gears. The areas of potential overlap occur where trap activity is very sparse and due to this, the scale of the site, and spatial footprint of both gear types it is unlikely that use of these gears will overlap. Considering the annual average fishing effort for anchored nets and lines (under 12 m) is low (1.74 days), the low probability of spatial overlap and the resilience of the features to all but intense fishing activity, any in-combination impact is considered insignificant.

Therefore, MMO concludes that the combined pressures from anchored nets and lines and traps will not result in a significant risk of hindering the achievement of the conservation objectives for the Offshore Brighton MPA at the levels described.

5.3 Part C conclusion

MMO concludes that fishing interactions in-combination will not result in a significant risk of hindering the achievement of the conservation objectives for Offshore Brighton MPA.

Further management measures will not therefore be implemented for fishing activities currently occurring within the MPA.

6 Conclusion and proposed management

Part A of this assessment concluded that bottom towed gear, anchored nets and lines and traps are capable of affecting (other than insignificantly) the designated features of Offshore Brighton MPA.

Bottom towed gear interactions with the high energy circalittoral rock feature have not been included in this assessment as they have already been addressed in the MMO Stage 2 assessment of Offshore Brighton MPA and prohibited by the MMO Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023[4].

Part B of this assessment concluded that ongoing use of bottom towed gear on the sedimentary features of Offshore Brighton MPA may hinder the achievement of the conservation objectives of the MPA. Part B also concluded that the ongoing use of anchored nets and lines and traps at the described levels does not pose a significant risk of hindering the conservation objectives.

Part C of this assessment concluded that the combined pressures from anchored nets and lines and traps and other relevant activities do not pose a significant risk of hindering the achievement of the conservation objectives of the MPA.

To ensure that fishing activities do not result in a significant risk of hindering the conservation objectives, MMO propose to implement a byelaw to prohibit the use of bottom towed gear on the sedimentary features of Offshore Brighton MPA.

Figure 2 shows the proposed management area in line with the conclusions set out above.

The boundaries of the proposed management area include an appropriate buffer zone to prevent direct damaging physical interactions between fishing activities and the designated features to be protected. The rationale for determining buffer size can be found in in Annex 2 of the Stage 3 MPA Site Assessment Methodology document[7].

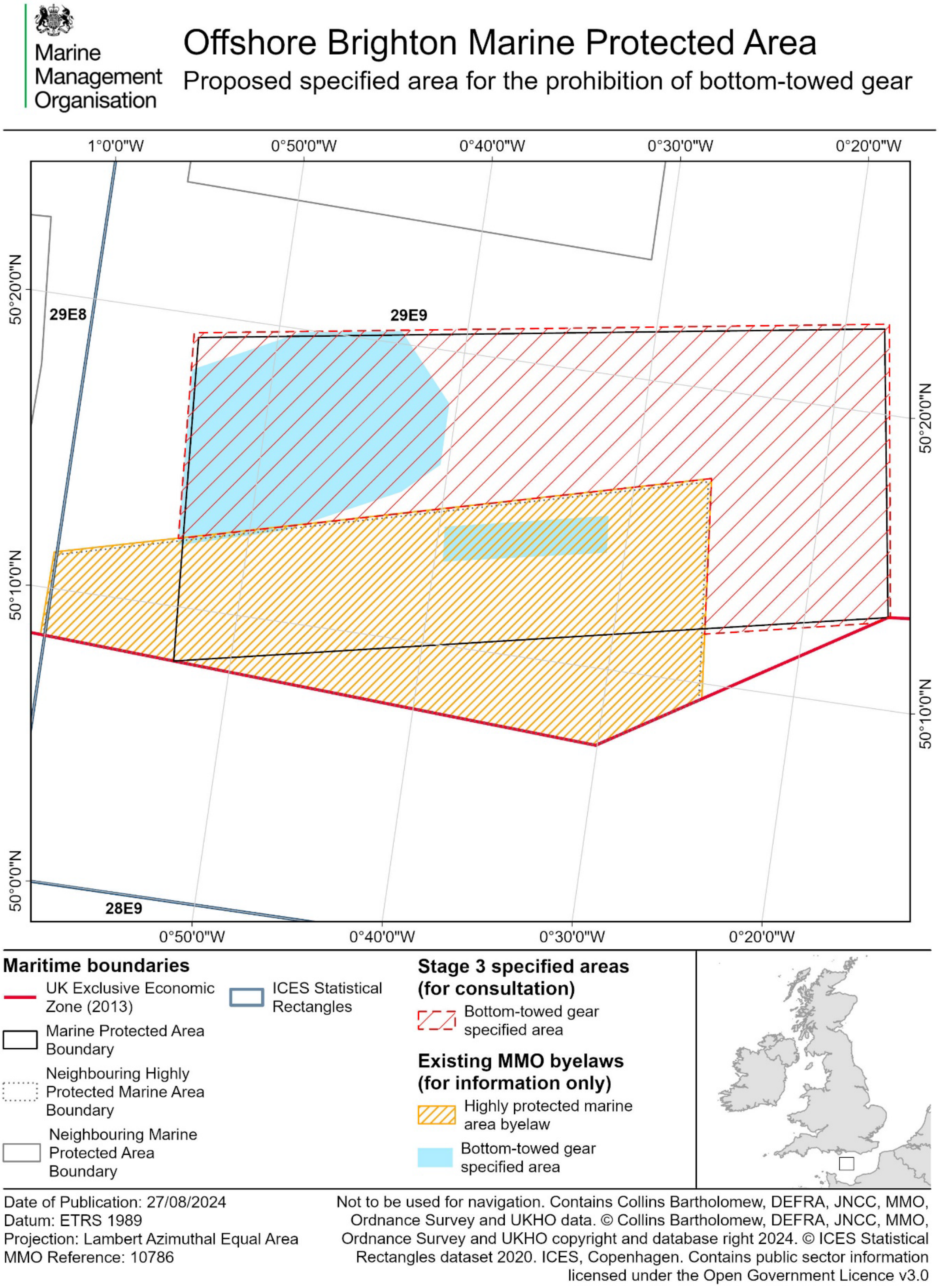

Figure 2: Map of proposed management.

7 Review of this assessment

MMO will review this assessment every five years, or earlier if significant new information is received. Such information could include:

- updated conservation advice;
- updated advice on the condition of the site's feature(s);
- significant increase in activity levels.

To coordinate the collection and analysis of information regarding activity levels, and to ensure that any required management is implemented in a timely manner, a monitoring and control plan will be implemented for this site. This plan will be developed in line with MMO's Monitoring and Control Plan framework.

References

De-Bastos, E.S.R., Hill, J.M., Garrard, S.L. and Watson, A. (2023) 'Ophiothrix fragilis and/or Ophiocomina nigra brittlestar beds on sublittoral mixed sediment', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1068.

De-Bastos, E.S.R., Marshall, C.E. and Watson, A. (2023) 'Kurtiella bidentata and Thyasira spp. in circalittoral muddy mixed sediment', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/374.

Hiddink, J.G., Jennings, S., Kaiser, M.J., Queirós, A.M., Duplisea, D.E. and Piet, G.J. (2006) 'Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats', *Canadian Journal of Fisheries and Aquatic Sciences*, 63(4), pp. 721–736.

Marshall, C., Ashley, M. and Watson, A. (2023) 'Hesionura elongata and Microphthalmus similis with other interstitial polychaetes in infralittoral mobile coarse sand', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/379.

McQuillan, R.M., Tillin, H.M. and Watson, A. (2023) 'Dense Lanice conchilega and other polychaetes in tide-swept infralittoral sand and mixed gravelly sand', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/116.

Perry, F. and Watson, A. (2023a) 'Cerianthus lloydii with Nemertesia spp. and other hydroids in circalittoral muddy mixed sediment', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1092.

Perry, F. and Watson, A. (2023b) 'Sabella pavonina with sponges and anemones on infralittoral mixed sediment', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1088.

Perry, F. and Watson, A. (2024) 'Cerianthus lloydii and other burrowing anemones in circalittoral muddy mixed sediment', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1091.

Pikesley, S.K., Solandt, J.-L., Trundle, C. and Witt, M.J. (2021) 'Benefits beyond "features": Cooperative monitoring highlights MPA value for enhanced seabed integrity', *Marine Policy*, 134.

Readman, J.A.J. (2016a) 'Crepidula fornicata with ascidians and anemones on infralittoral coarse mixed sediment', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1139.

Readman, J.A.J. (2016b) 'Flustra foliacea, small solitary and colonial ascidians on tide-swept circalittoral bedrock or boulders’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/1102.

Readman, J.A.J. (2016c) ‘Flustra foliacea and colonial ascidians on tide-swept moderately wave-exposed circalittoral rock’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/1096.

Readman, J.A.J. (2016d) ‘Flustra foliacea and Haliclona oculata with a rich faunal turf on tide-swept circalittoral mixed substrata’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/248.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023a) ‘Bryozoan turf and erect sponges on tide-swept circalittoral rock’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/9.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023b) ‘Mixed turf of bryozoans and erect sponges with Cylista elegans on tide-swept circalittoral rock’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1086.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023c) ‘Mixed turf of bryozoans and erect sponges with Dysidia fragilis and Actinothoe sphyrodeta on tide-swept wave-exposed circalittoral rock’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1085.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023d) ‘Phakellia ventilabrum and axinellid sponges on deep, wave-exposed circalittoral rock’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/87.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023e) ‘Polyclinum aurantium and Flustra foliacea on sand-scoured tide-swept moderately wave-exposed circalittoral rock’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/284.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023f) ‘Sparse sponges, Nemertesia spp. and Alcyonidium diaphanum on circalittoral mixed substrata’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/119.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023g) ‘Sponges and anemones on vertical circalittoral bedrock’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1129.

Readman, J.A.J., Lloyd, K.A. and Watson, A. (2023h) ‘Suberites spp. with a mixed turf of crisiids and Bugula spp. on heavily silted moderately wave-exposed shallow circalittoral rock', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/1101.

Readman, J.A.J. and Watson, A. (2024) 'Flustra foliacea and Hydrallmania falcata on tide-swept circalittoral mixed sediment', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/74.

Rijnsdorp, A.D., Bolam, S.G., Garcia, C., Hiddink, J.G., Hintzen, N.T., van Denderen, P.D. and van Kooten, T. (2018) 'Estimating sensitivity of seabed habitats to disturbance by bottom trawling based on the longevity of benthic fauna', *Ecological Applications*, 28(5), pp. 1302–1312.

Stamp, T.E. (2016) 'Molgula manhattensis with a hydroid and bryozoan turf on tide-swept moderately wave-exposed circalittoral rock', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Review*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/1063.

Stamp, T.E. and Tyler-Walters, H. (2018a) 'Tubularia indivisa and cushion sponges on tide-swept turbid circalittoral bedrock', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/1164.

Stamp, T.E. and Tyler-Walters, H. (2018b) 'Tubularia indivisa on tide-swept circalittoral rock', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/128.

Stamp, T.E. and Williams, E. (2021) 'Alcyonium digitatum with dense Tubularia indivisa and anemones on strongly tide-swept circalittoral rock', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitat/detail/1053.

Tillin, H.M. (2023) 'Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles)', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1080.

Tillin, H.M. and Ashley, M. (2016) 'Hesionura elongata and Protodorvillea kefersteini in offshore coarse sand', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1113.

Tillin, H.M., Lloyd, K.A. and Watson, A. (2023) 'Balanus crenatus and Tubularia indivisa on extremely tide-swept circalittoral rock', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/349.

Tillin, H.M., Rayment, W.J. and Watson, A. (2023) 'Venerupis corrugata, Amphipholis squamata and Apseudes holthuisi in infralittoral mixed sediment', in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/354.

Tillin, H.M. and Watson, A. (2023a) ‘Branchiostoma lanceolatum in circalittoral coarse sand with shell gravel’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/244.

Tillin, H.M. and Watson, A. (2023b) ‘Cumaceans and Chaetozone setosa in infralittoral gravelly sand’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1112.

Tillin, H.M. and Watson, A. (2023c) ‘Glycera lapidum, Thyasira spp. and Amythasides macroglossus in offshore gravelly sand’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1136.

Tillin, H.M. and Watson, A. (2023d) ‘Glycera lapidum in impoverished infralittoral mobile gravel and sand’, in Tyler-Walters H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth.

Tillin, H.M. and Watson, A. (2023e) ‘Mediomastus fragilis, Lumbrineris spp. and venerid bivalves in circalittoral coarse sand or gravel’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/382.

Tillin, H.M. and Watson, A. (2023f) ‘Moerella spp. with venerid bivalves in infralittoral gravelly sand’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1111.

Tillin, H.M. and Watson, A. (2023g) ‘Polychaete-rich deep Venus community in offshore gravelly muddy sand’, in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1117.

Tillin, H.M. and Watson, A. (2023h) ‘Protodorvillea kefersteini and other polychaetes in impoverished circalittoral mixed gravelly sand’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1115.

Tyler-Walters, H., Durkin, O.C. and Watson, A. (2023) ‘Neopentadactyla mixta in circalittoral shell gravel or coarse sand’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/389.

Tyler-Walters, H., Tillin, H.M. and Watson, A. (2024) ‘Spirobranchus triqueter with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles’, in Tyler-Walters, H. and Hiscock, K. (eds) *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/177.

Annexes

Annex 1: Fishing activity data

Table A1. 1: VMS record count per nation group (UK, EU Member State (EU) and European Free Trade Association (EFTA)) and proportional activity (%), per gear, per gear group, per year (2016 to 2020), totals and annual average (2016 to 2020). All numbers are rounded to the nearest whole number.

			2016		2017		2018		2019		2020		2021		Total (2016 to 2021)		Average (2016 to 2021)
Gear group	**Gear code**	**Nation group**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**
Anchored Net/Line	**GTR**	EU	0	0	1	100	0	0	0	0	0	0	1	100	2	100	0
	GTR Total		**0**	**0**	**1**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**100**	**2**	**2**	**0**
	LLS	EU	68	100	27	100	0	0	0	0	0	0	0	0	95	100	16
	LLS Total		**68**	**100**	**27**	**96**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**95**	**98**	**16**
Anchored Net/Line Total			**68**	**2**	**28**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**97**	**1**	**16**
Demersal Seine	**SDN**	EU	9	100	14	100	9	100	44	100	10	63	9	100	95	94	16
	SDN	UK	0	0	0	0	0	0	0	0	6	38	0	0	6	6	1
	SDN Total		**9**	**10**	**14**	**25**	**9**	**43**	**44**	**50**	**16**	**36**	**9**	**6**	**101**	**22**	**17**
	SPR	EU	5	100	1	100	0	0	3	100	0	0	0	0	9	100	2
	SPR Total		**5**	**6**	**1**	**2**	**0**	**0**	**3**	**3**	**0**	**0**	**0**	**0**	**9**	**2**	**2**
	SSC	EU	40	53	16	39	8	67	20	54	10	34	68	44	162	47	27
	SSC	UK	36	47	25	61	4	33	17	46	19	66	85	56	186	53	31
	SSC Total		**76**	**84**	**41**	**73**	**12**	**57**	**37**	**42**	**29**	**64**	**153**	**94**	**348**	**75**	**58**
	SX	EU	0	0	0	0	0	0	4	100	0	0	0	0	4	100	1
	SX Total		**0**	**0**	**0**	**0**	**0**	**0**	**4**	**5**	**0**	**0**	**0**	**0**	**4**	**1**	**1**
Demersal Seine Total			**90**	**3**	**56**	**3**	**21**	**1**	**88**	**4**	**45**	**2**	**162**	**2**	**462**	**3**	**77**
Demersal trawl	**OTB**	EU	1,942	100	1,721	100	1,232	100	1,505	100	1,099	100	4,947	100	12,446	100	2,074
	OTB Total		**1,942**	**98**	**1,721**	**98**	**1,232**	**97**	**1,505**	**97**	**1,099**	**96**	**4,947**	**99**	**12,446**	**98**	**2,074**
	OTT	EU	0	0	1	100	6	100	3	100	12	100	0	0	22	100	4
	OTT Total		**0**	**0**	**1**	**0**	**6**	**0**	**3**	**0**	**12**	**1**	**0**	**0**	**22**	**0**	**4**

			2016		2017		2018		2019		2020		2021		Total (2016 to 2021)		Average (2016 to 2021)
Gear group	**Gear code**	**Nation group**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**
	TB	EU	0	0	0	0	0	0	0	0	0	0	26	100	26	100	4
	TB Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**26**	**1**	**26**	**0**	**4**
	TBB	EU	32	100	42	100	35	100	36	100	30	100	16	100	191	100	32
	TBB Total		**32**	**2**	**42**	**2**	**35**	**3**	**36**	**2**	**30**	**3**	**16**	**0**	**191**	**2**	**32**
Demersal trawl Total			**1,974**	**68**	**1,764**	**86**	**1,273**	**66**	**1,544**	**66**	**1,141**	**63**	**4,989**	**70**	**12,685**	**70**	**2,114**
Dredge	**DRB**	EU	352	99	87	58	147	67	375	89	371	97	1647	94	2979	91	497
	DRB	UK	5	1	64	42	71	33	46	11	10	3	111	6	307	9	51
	DRB Total		**357**	**100**	**151**	**100**	**218**	**100**	**421**	**100**	**381**	**100**	**1,758**	**100**	**3,286**	**100**	**548**
Dredge Total			**357**	**12**	**151**	**7**	**218**	**11**	**421**	**18**	**381**	**21**	**1,758**	**25**	**3,286**	**18**	**548**
Midwater Trawl	**OTM**	EU	381	98	47	100	381	100	180	100	240	100	142	100	1371	99	229
	OTM	UK	6	2	0	0	1	0	0	0	0	0	0	0	7	1	1
	OTM Total		**387**	**99**	**47**	**92**	**382**	**91**	**180**	**91**	**240**	**98**	**142**	**99**	**1,378**	**95**	**230**
	PTM	EU	0	0	0	0	33	89	9	53	4	100	1	100	47	69	8
	PTM	UK	5	100	4	100	4	11	8	47	0	0	0	0	21	31	4
	PTM Total		**5**	**1**	**4**	**8**	**37**	**9**	**17**	**9**	**4**	**<1**	**1**	**<1**	**68**	**5**	**11**
Midwater Trawl Total			**392**	**14**	**51**	**2**	**419**	**22**	**197**	**8**	**244**	**13**	**143**	**2**	**1,446**	**8**	**241**
Traps	**FPO**	UK	5	100	6	100	4	100	92	100	0	0	60	100	167	100	28
	FPO Total		**5**	**100**	**6**	**100**	**4**	**100**	**92**	**100**	**0**	**0**	**60**	**100**	**167**	**100**	**28**
Traps Total			**5**	**0**	**6**	**0**	**4**	**0**	**92**	**4**	**0**	**0**	**60**	**1**	**167**	**1**	**28**
Unknown	**NK**	EU	0	0	0	0	0	0	12	100	0	0	0	0	12	80	2
	NK	EFTA	3	100	0	0	0	0	0	0	0	0	0	0	3	20	1
	NK Total		**3**	**100**	**0**	**0**	**0**	**0**	**12**	**100**	**0**	**0**	**0**	**0**	**15**	**100**	**3**
Unknown Total			**3**	**0**	**0**	**0**	**0**	**0**	**12**	**1**	**0**	**0**	**0**	**0**	**15**	**0**	**3**
Grand Total			**2,889**	**4**	**2,056**	**3**	**1,935**	**3**	**2,354**	**3**	**1,811**	**3**	**7,113**	**11**	**18,158**	**4**	**3,026**

Table A1. 2: UK live weight landings tonnage (t) estimates by gear from vessels over 12 m in length in the MMO section of Offshore Brighton MPA (2016 to 2020).

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Demersal Seine	SDN	0	0	0	0	3.09	3.09	0.62
	SSC	24.47	23.70	2.30	13.01	15.34	78.82	15.76
Demersal Seine Total		**24.47**	**23.70**	**2.30**	**13.01**	**18.43**	**81.91**	**16.38**
Demersal trawl	TBB	0	0	0	0	0	0	0
Demersal trawl Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**
Dredge	DRB	0.82	8.67	7.04	5.85	1.53	23.91	4.78
	HMD	0	0	0	0	0	0	0
Dredge Total		**0.82**	**8.67**	**7.04**	**5.85**	**1.53**	**23.91**	**4.78**
Midwater Trawl	OTM	65.28	0	13.37	0	0	78.65	15.73
	PTM	92.96	119.97	130.2	220.35	0	563.49	112.7
Midwater Trawl Total		**158.24**	**119.97**	**143.57**	**220.35**	**0**	**642.14**	**128.43**
Traps	FPO	0.31	7.09	3.62	48.62	0	59.64	11.93
Traps Total		**0.31**	**7.09**	**3.62**	**48.62**	**0**	**59.64**	**11.93**
Grand Total		**183.85**	**159.44**	**156.53**	**287.82**	**19.96**	**807.61**	**161.52**

Table A1. 3: EU27 live weight landings tonnage (t) estimates by gear from vessels over 12 m in length in the MMO section of Offshore Brighton MPA (2016 to 2020).

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored Net/Line	LLS	9.16	3.76	0	0	0	12.93	2.59
Anchored Net/Line Total		**9.16**	**3.76**	**0**	**0**	**0**	**12.93**	**2.59**
Demersal Seine	SDN	0.70	0.73	0.66	2.21	0.38	4.69	0.94
	SPR	0.04	0.03	0	0	0	0.07	0.01
	SSC	26.48	12.15	4.95	11.41	4.66	59.64	11.93
Demersal Seine Total		**27.22**	**12.91**	**5.61**	**13.62**	**5.05**	**64.40**	**12.88**
Demersal trawl	OTB	114.31	100.70	83.87	88.56	81.17	468.62	93.72
	OTT	0	0	0	0	0	0.02	0
	TBB	12.05	18.43	13.18	14.13	8.10	65.88	13.18
Demersal trawl Total		**126.37**	**119.13**	**97.07**	**102.69**	**89.27**	**534.52**	**106.90**
Dredge	DRB	30.53	9.23	13.40	17.09	2.49	72.75	14.55
Dredge Total		30.53	9.23	13.40	17.09	2.49	72.75	14.55
Midwater Trawl	OTM	2,140.40	609.85	2,113.44	640.73	1,037.16	6,541.59	1,308.32
	PTM	0	0	0.63	0.81	0.27	1.72	0.34
Midwater Trawl Total		**2,140.40**	**609.85**	**2,114.08**	**641.54**	**1,037.43**	**6,543.30**	**1,308.66**
Grand Total		**2,333.68**	**754.88**	**2,230.16**	**774.94**	**1,134.24**	**7,227.90**	**1,445.58**

Table A1. 4: Percentage of each ICES rectangle intersected by the MMO section of Offshore Brighton MPA.

ICES rectangle	Percentage overlap (%)
29E9	21.73

Table A1. 5: UK live weight landings tonnage (t) estimates by gear from vessels under 12 m in length for the MMO section of Offshore Brighton MPA (2016 to 2020). All numbers are rounded to the nearest two decimal places.

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored Net/Line	GN	0	0.04	0	0	0	0.04	0.01
Anchored Net/Line Total		**0**	**0.04**	**0**	**0**	**0**	**0.04**	**0.01**
Demersal trawl	OT	0.04	0	0	0	0	0.04	0.01
	TBB	0	0.05	0	0	0	0.05	0.01
Demersal trawl Total		**0.04**	**0.05**	**0**	**0**	**0**	**0.10**	**0.02**
Dredge	DRB	0.18	0	0.03	0.80	0	1.01	0.20
Dredge Total		**0.18**	**0**	**0.03**	**0.80**	**0**	**1.01**	**0.20**
Midwater - Gill Drift	GND	0	0	0	0	0	0	0
Midwater - Gill Drift Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**
Midwater Hook/Lines	LHP	0.36	0.32	0.23	0.13	0	1.03	0.21
	LX	0	0.22	0	0	0	0.22	0.04
Midwater Hook/Lines Total		**0.36**	**0.54**	**0.23**	**0.13**	**0**	**1.25**	**0.25**
Traps	FPO	0.05	0.21	11.68	0.06	0.03	12.03	2.41
Traps Total		**0.05**	**0.21**	**11.68**	**0.06**	**0.03**	**12.03**	**2.41**
Grand Total		**0.63**	**0.84**	**11.94**	**0.98**	**0.03**	**14.42**	**2.88**

Table A1. 6: EU27 live weight landings tonnage (t) estimates by gear from vessels under 12 m in length for the MMO section of Offshore Brighton MPA (2016 to 2020). All numbers are rounded to the nearest two decimal places.

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored Net/Line	LLS	0.21	0	0.10	0	0	0.30	0.06
	GTR	0	0.07	0.01	0.04	0	0.12	0.02
	GNS	0.06	0.07	0	0	0	0.12	0.02
	GTN	0	0	0	0.01	0	0.01	0
Anchored Net/Line Total		**0.26**	**0.14**	**0.11**	**0.05**	**0**	**0.57**	**0.11**
Demersal Seine	SSC	0	0	0.33	2.35	0.46	3.14	0.63
Demersal Seine Total		**0**	**0**	**0.33**	**2.35**	**0.46**	**3.14**	**0.63**
Demersal trawl	OTB	0.20	0	0.37	0	0.01	0.58	0.12
Demersal trawl Total		**0.20**	**0**	**0.37**	**0**	**0.01**	**0.58**	**0.12**
Dredge	DRB	1.19	1.11	1.38	0.12	0.23	4.03	0.81
Dredge Total		**1.19**	**1.11**	**1.38**	**0.12**	**0.23**	**4.03**	**0.81**
Midwater Hook/Lines	LHP	0.45	0	0.15	0	0	0.61	0.12
Midwater Hook/Lines Total		**0.45**	**0**	**0.15**	**0**	**0**	**0.61**	**0.12**
Traps	FPO	0	0.09	1.24	7.58	0.49	9.41	1.88
Traps Total		**0**	**0.09**	**1.24**	**7.58**	**0.49**	**9.41**	**1.88**
Grand Total		**2.10**	**1.35**	**3.58**	**10.11**	**1.2**	**18.33**	**3.67**

Table A1. 7: Mean annual surface and subsurface SAR values for C-squares intersecting the MMO section of Offshore Brighton MPA (2016 to 2020). All numbers are rounded to the nearest two decimal places.

Gear group	SAR category	2016	2017	2018	2019	2020
Demersal Seines	Surface	0.83	0.57	0.14	0.39	0.44
	Subsurface	0.04	0.03	0.01	0.02	0.02
Dredges	Surface	0.02	0.02	0.01	0.02	0.01
	Subsurface	0.02	0.02	0.01	0.02	0.01
Demersal Trawls	Surface	1.52	0.86	1.33	1.09	1.16
	Subsurface	0.17	0.11	0.15	0.12	0.12
Bottom Towed Gear	Surface	2.37	1.46	1.49	1.51	1.6
	Subsurface	0.22	0.17	0.17	0.16	0.14

Table A1. 8: Fishing effort (days) recorded by UK vessels under 12 m in length, separated by gear type for the area of Offshore Brighton MPA that intersects the marine portion of ICES rectangles 29E9 (2016 to 2021). ICES rectangle level data has been apportioned to the MPA based on the percentage area of the ICES rectangle that intersects the MPA (see Table A1. 4).

Gear group	Fishing effort (days at sea)							
	2016	2017	2018	2019	2020	2021	Total (2016 to 2021)	Annual average (2016 to 2021)
Demersal trawl	0.54	0.22	0	0	0	2.39	3.15	0.53
Dredge	0.22	0	0.22	0.22	0	2.59	3.24	0.54
Bottom towed gear total	**0.76**	**0.22**	**0.22**	**0.22**	**0**	**4.98**	**6.39**	**1.07**
Midwater hooks and lines	2.72	3.91	3.26	2.17	0	0.22	12.28	2.05
Midwater gear total	**2.72**	**3.91**	**3.26**	**2.17**	**0**	**0.22**	**12.28**	**2.05**
Traps	0.22	1.30	11.84	1.52	1.30	30.32	46.51	7.75
Anchored nets and lines	0	0.43	0	0	0	1.30	1.74	0.29
Static gear total	**0.22**	**1.74**	**11.84**	**1.52**	**1.30**	**31.62**	**48.25**	**8.04**
MPA total	**3.69**	**5.87**	**15.32**	**3.91**	**1.30**	**36.82**	**66.92**	**11.15**

Annex 2: Biotope information

Table A2. 1: High energy circalittoral rock biotopes that may be found within Offshore Brighton MPA with sensitivity to the abrasion/disturbance and penetration of the substrate on the surface of the seabed.

Biotope	Sensitivity
Balanus crenatus and *Tubularia indivisa* on extremely tide-swept circalittoral rock (Tillin, Lloyd and Watson, 2023)	Abrasion: Low Penetration: Not relevant
Tubularia indivisa on tide-swept circalittoral rock (Stamp and Tyler-Walters, 2018b)	Abrasion: Low Penetration: Not relevant
Tubularia indivisa and cushion sponges on tide-swept turbid circalittoral bedrock (Stamp and Tyler-Walters, 2018a)	Abrasion: Low Penetration: Not relevant
Alcyonium digitatum with dense *Tubularia indivisa* and anemones on strongly tide-swept circalittoral rock (Stamp and Williams, 2021)	Abrasion: Low Penetration: Not relevant
Phakellia ventilabrum and axinellid sponges on deep, wave-exposed circalittoral rock (Readman, Lloyd and Watson, 2023d)	Abrasion: High Penetration: Not relevant
Bryozoan turf and erect sponges on tide-swept circalittoral rock (Readman, Lloyd and Watson, 2023a)	Abrasion: Medium Penetration: Not relevant
Mixed turf of bryozoans and erect sponges with *Dysidia fragilis* and *Actinothoe sphyrodeta* on tide-swept wave-exposed circalittoral rock (Readman, Lloyd and Watson, 2023c)	Abrasion: Medium Penetration: Not relevant
Mixed turf of bryozoans and erect sponges with *Sagartia elegans* on tide-swept circalittoral rock (Readman, Lloyd and Watson, 2023b)	Abrasion: Medium Penetration: Not relevant
Flustra foliacea and colonial ascidians on tide-swept moderately wave-exposed circalittoral rock (Readman, 2016c)	Abrasion: Low Penetration: Not relevant
Polyclinum aurantium and *Flustra foliacea* on sand-scoured tide-swept moderately wave-exposed circalittoral rock (Readman, Lloyd and Watson, 2023e)	Abrasion: Low Penetration: Not relevant

Biotope	Sensitivity
Flustra foliacea, small solitary and colonial ascidians on tide-swept circalittoral bedrock or boulders (Readman, 2016b)	Abrasion: Low Penetration: Not relevant
Sparse sponges, *Nemertesia* spp., and *Alcyonidium diaphanum* on circalittoral mixed substrata (Readman, Lloyd and Watson, 2023f)	Abrasion: Medium Penetration: Not relevant
Suberites spp. with a mixed turf of crisiids and *Bugula* spp. on heavily silted moderately wave-exposed shallow circalittoral rock (Readman, Lloyd and Watson, 2023h)	Abrasion: Medium Penetration: Not relevant
Flustra foliacea and *Haliclona oculata* with a rich faunal turf on tide-swept circalittoral mixed substrata (Readman, 2016d)	Abrasion: Low Penetration: Not relevant
Molgula manhattensis with a hydroid and bryozoan turf on tide-swept moderately wave-exposed circalittoral rock (Stamp, 2016)	Abrasion: Low Penetration: Not relevant
Sponges and anemones on vertical circalittoral bedrock (Readman, Lloyd and Watson, 2023g)	Abrasion: Medium Penetration: Not relevant

Table A2. 2: Subtidal coarse sediment biotopes that may be found within Offshore Brighton MPA with sensitivity to the abrasion / disturbance and penetration of the substrate on the surface of the seabed, smothering and siltation rate changes (light) and changes in

Biotope	Sensitivity
Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles) (Tillin, 2023)	Abrasion: Not sensitive Penetration: Not sensitive Smothering and siltation rate changes (light): Not sensitive Changes in suspended solids (water clarity): Not sensitive
Moerella spp. with venerid bivalves in infralittoral gravelly sand (Tillin and Watson, 2023f)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Low
Hesionura elongata and *Microphthalmus similis* with other interstitial polychaetes in infralittoral mobile coarse sand (Marshall, Ashley and Watson, 2023)	Abrasion: Low Penetration: Medium Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Not sensitive
Glycera lapidum in impoverished infralittoral mobile gravel and sand (Tillin and Watson, 2023d)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Not sensitive
Cumaceans and *Chaetozone setosa* in infralittoral gravelly sand (Tillin and Watson, 2023b)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Low Changes in suspended solids (water clarity): Low
Dense *Lanice conchilega* and other polychaetes in tide-swept infralittoral sand and mixed gravelly sand (McQuillan, Tillin and Watson, 2023)	Abrasion: Not sensitive Penetration: Not sensitive Smothering and siltation rate changes (light): Low Changes in suspended solids (water clarity): Not sensitive

Biotope	Sensitivity
Pomatoceros triqueter with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (Tyler-Walters, Tillin and Watson, 2024)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Low Changes in suspended solids (water clarity): Not sensitive
Mediomastus fragilis, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel (Tillin and Watson, 2023e)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Low
Protodorvillea kefersteini and other polychaetes in impoverished circalittoral mixed gravelly sand (Tillin and Watson, 2023h)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): No evidence Changes in suspended solids (water clarity): Not sensitive
Neopentadactyla mixta in circalittoral shell gravel or coarse sand (Tyler-Walters, Durkin and Watson, 2023)	Abrasion: Not sensitive Penetration: Medium Smothering and siltation rate changes (light): Not sensitive Changes in suspended solids (water clarity): Medium
Branchiostoma lanceolatum in circalittoral coarse sand with shell gravel (Tillin and Watson, 2023a)	Abrasion: Low Penetration: Medium Smothering and siltation rate changes (light): Low Changes in suspended solids (water clarity): Not sensitive
Glycera lapidum, *Thyasira* spp. and *Amythasides macroglossus* in offshore gravelly sand (Tillin and Watson, 2023c)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Not sensitive
Hesionura elongata and *Protodorvillea kefersteini* in offshore coarse sand (Tillin and Ashley, 2016)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): No evidence Changes in suspended solids (water clarity): No evidence

Table A2. 3: Subtidal mixed sediments biotopes that may be found within Offshore Brighton MPA with sensitivity to the abrasion / disturbance and penetration of the substrate on the surface of the seabed, smothering and siltation rate changes (light) and changes in suspended solids (water clarity).

Biotope	Sensitivity
Crepidula fornicata with ascidians and anemones on infralittoral coarse mixed sediment (Readman, 2016a)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Low Changes in suspended solids (water clarity): Not sensitive
Sabella pavonina with sponges and anemones on infralittoral mixed sediment (Perry and Watson, 2023b)	Abrasion: Medium Penetration: Medium Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Not sensitive
Venerupis senegalensis, *Amphipholis squamat* and *Apseudes latreilli* in infralittoral mixed sediment (Tillin, Rayment and Watson, 2023)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Low Changes in suspended solids (water clarity): Low
Cerianthus lloydii and other burrowing anemones in circalittoral muddy mixed sediment (Perry and Watson, 2024)	Abrasion: Medium Penetration: Medium Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Not sensitive
Cerianthus lloydii with *Nemertesia* spp. and other hydroids in circalittoral muddy mixed sediment (Perry and Watson, 2023a)	Abrasion: Medium Penetration: Medium Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Not sensitive
Mysella bidentata and *Thyasira* spp. in circalittoral muddy mixed sediment (De-Bastos, Marshall and Watson, 2023)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Low Changes in suspended solids (water clarity): Not sensitive
Flustra foliacea and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment (Readman and Watson, 2024)	Abrasion: Medium Penetration: Medium Smothering and siltation rate changes (light): Low

Biotope	Sensitivity
	Changes in suspended solids (water clarity): Not sensitive
Ophiothrix fragilis and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment (De-Bastos *et al.*, 2023)	Abrasion: Medium Penetration: Medium Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Not sensitive
Polychaete-rich deep [Venus] community in offshore mixed sediments (Tillin and Watson, 2023g)	Abrasion: Low Penetration: Low Smothering and siltation rate changes (light): Medium Changes in suspended solids (water clarity): Low