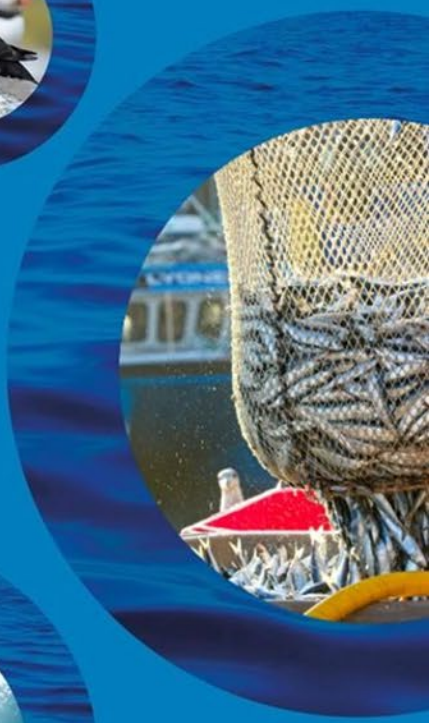
Marine Management Organisation

MMO Stage 3 Site Assessment: West of Wight-Barfleur MPA (Draft)



...ambitious for our seas and coasts

Title: MMO Stage 3 Site Assessment: West of Wight-Barfleur MPA (Draft)

Contents

Executive summary

This assessment analyses the impact of anchored nets and lines, bottom towed gear and traps on the designated features subtidal coarse sediment and subtidal mixed sediments, in West of Wight-Barfleur 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 there is a significant risk of the ongoing use of bottom towed gear on the sedimentary features of West of Wight-Barfleur MPA hindering the achievement of the conservation objectives of the MPA. The Marine Management Organisation (MMO) will therefore introduce management measures to prohibit the use of bottom towed fishing gear throughout the MPA.

1 Introduction

This assessment considers whether fishing activities are compatible with the conservation objectives of West of Wight-Barfleur 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, and conservation objectives and general management approaches:

- JNCC Site Information – West of Wight-Barfleur MCZ[1]
- Defra Fact Sheet – West of Wight-Barfleur MCZ[2]

West of Wight-Barfleur MPA is an offshore site located in the central English Channel, approximately 50 km south of the Dorset coast, between the Isle of Wight and Barfleur Point, France. Covering an area of approximately 138 km², depths in the site range from around 50 m to 100 m below chart datum. The location of the site in the western central portion of the English Channel indicates that tidal current velocity in West of Wight-Barfleur MPA is likely to be high (James et al., 2007). To the south, the site is bounded by the median line between English and French waters, which is the boundary of the UK Exclusive Economic Zone (**Figure 1**).

West of Wight-Barfleur MPA was designated as a marine conservation zone (MCZ) in 2019 for the protection of the broad-scale habitat features 'subtidal coarse sediment' and 'subtidal mixed sediments'. Current survey data suggests that the central portion of the site is dominated by subtidal coarse sediment, intersected by a broad curve of subtidal mixed sediments extending from the northern edge of the site to the eastern and southern site boundaries. These habitats suggest a wide variety of species inhabit the site, both on and within the sediment features, including communities of anemones, polychaete worms, starfish, venerid bivalves, encrusting hydroids, Bryozoa and urchins.

[1] JNCC Site Information Centre – West of Wight-Barfleur MCZ: jncc.gov.uk/our-work/west-of-wight-barfleur-mpa (Last accessed on: 17 August 2023).
[2] Defra Factsheet – West of Wight-Barfleur MCZ: www.gov.uk/government/publications/marine-conservation-zones-west-of-wight-barfleur (Last accessed on: 17 August 2023).

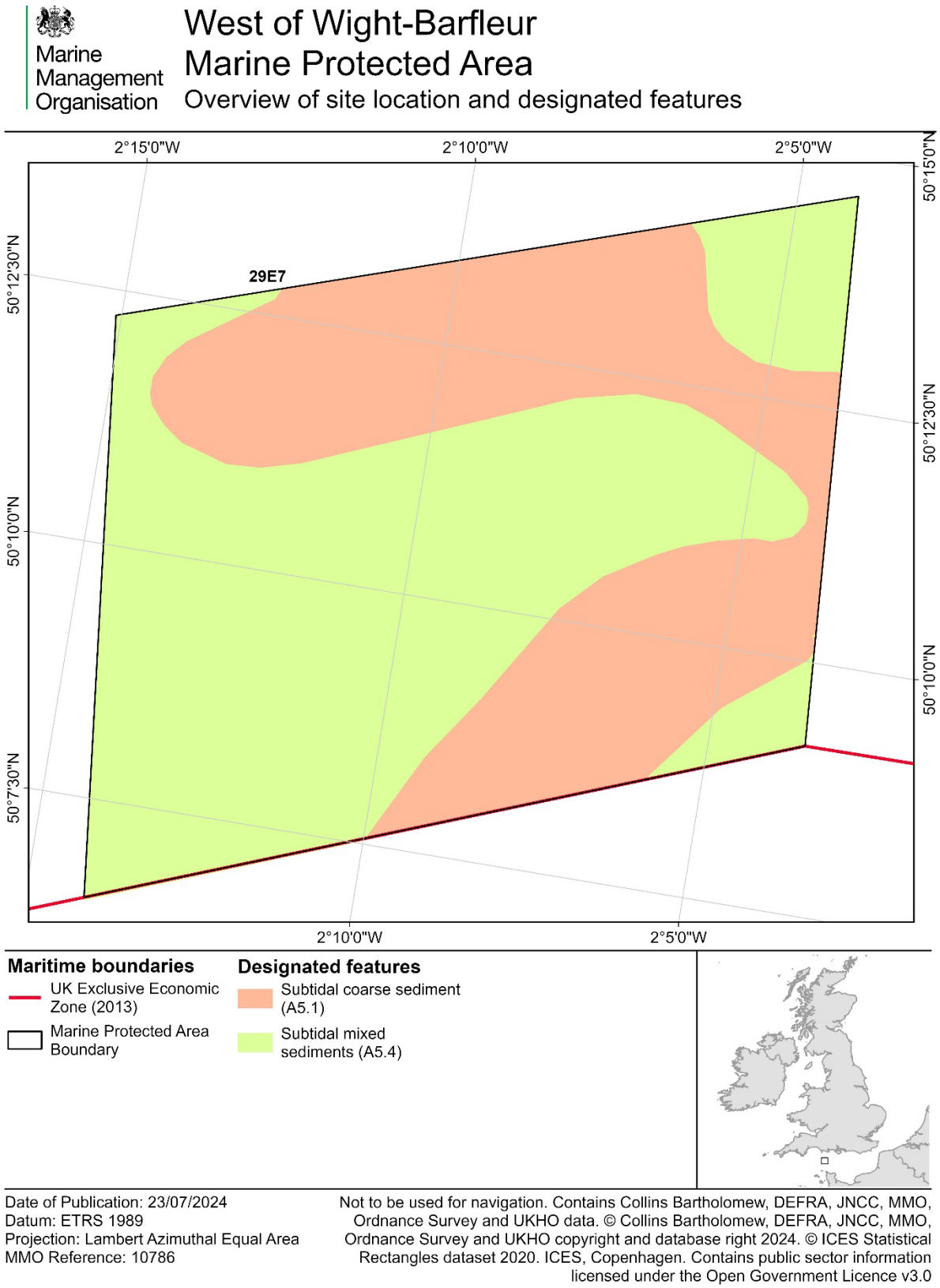


Figure 1: Site overview map.

The designated features and their general management approaches are set out below in **Table 1**. The general management approaches for the features of West of Wight-Barfleur MPA have been set based on a vulnerability assessment. The attributes driving these approaches are described in JNCC's supplementary advice on conservation objectives[1].

Table 1: Designated features and general management approaches.

Designated feature	General management approach
Subtidal coarse sediment	Recover to favourable condition
Subtidal mixed sediments	

There is no feature condition assessment available for this site; in its absence the vulnerability assessment, which includes sensitivity and exposure information for features and activities in a site, is used as a proxy for condition. More information on this can be found in JNCC's supplementary advice on conservation objectives for West of Wight-Barfleur MPA[1].

As set out in JNCC's conservation advice statements, the designated sediment features of the site are considered to be in unfavourable condition. JNCC advise that benthic trawling and activities surrounding telecommunications cable infrastructure may require additional management to maintain or recover the features of the site[1].

2.2 Scope of this assessment

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

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 described by section 126 of the Marine and Coastal Access Act 2009[3].

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. if 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. if 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] For more information see: www.legislation.gov.uk/ukpga/2009/23/section/126.

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.

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

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

For more information about the above evidence sources, please see the MPA Fisheries Assessment Methodology document[4], which describes each type of fishing activity evidence and summarises the strengths and limitations of each source.

[4] MPA Fisheries Assessment Methodology: www.gov.uk/government/publications/stage-3-site-assessments (Last accessed on: 27 August 2024).

Table 2: Fishing activities covered by this assessment present in VMS data from 2016 to 2021 and landings data from 2016 to 2020 for West of Wight-Barfleur MPA.

Gear type	Gear name	Gear code	Justification
Anchored nets and lines	Gill nets (not specified)	GN	Present in under 12 m landings data for ICES statistical rectangles that overlap the site.
	Longlines (demersal)	LLS	
	Set gillnet (anchored)	GNS	
	Trammel net	GTR	
Bottom towed gear	Beam trawl	TBB	Present in VMS records and under 12 m landings data for ICES statistical rectangles that overlap the site.
	Bottom otter trawl	OTB	
	Danish / anchor seine	SDN	Present in VMS data.
	Otter trawls (unspecified)	OT	Present in under 12 m landings data for ICES statistical rectangles that overlap the site.
	Scottish / fly seine	SSC	Present in VMS records and under 12 m landings data for ICES statistical rectangles that overlap the site.
	Towed dredge	DRB	
	Twin bottom otter trawl	OTT	
Midwater gear	Drift gillnet	GND	Present in under 12 m landings data for ICES statistical rectangles that overlap the site.
	Encircling gillnet	GNC	
	Hand fishing	HF	
	Hand-operated pole-and-line	LHP	
	Hook and line (unspecified)	LX	
	Midwater otter trawl	OTM	Present in VMS records and under 12 m landings data for ICES statistical rectangles that overlap the site.
	Midwater pair trawl	PTM	
Traps	Pot / creel	FPO	
Unknown	Not known	NK	Present in VMS data.

3.2 Pressures and activities screened out

This section identifies activities or pressures that are **occurring but do not need to be considered** for West of Wight-Barfleur MPA.

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

- **Midwater gear:** although the use of midwater gear does occur within West of Wight-Barfleur MPA, there is no feasible pathway for gears of this type to interact with benthic designated features under normal operation. 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 West of Wight-Barfleur 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' has been declared as having been used to land fish from ICES statistical rectangles overlapping the site. 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[5];
- Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear[6]; and
- Stage 3 Fishing Gear MPA Impacts Evidence Traps[7].

[5] Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines: www.gov.uk/government/publications/stage-3-impacts-evidence (Last accessed on: 27 August 2024).
[6] Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear: www.gov.uk/government/publications/stage-3-impacts-evidence (Last accessed on: 27 August 2024).
[7] Stage 3 Fishing Gear MPA Impacts Evidence Traps: www.gov.uk/government/publications/stage-3-impacts-evidence (Last accessed on: 27 August 2024).

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 activities screened out in **sections 3.1** and **3.2**.

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 the 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, or that the feature is not sensitive to the pressure.

Table 3: Summary of pressures on designated features of West of Wight-Barfleur MPA to be taken forward to Part B.

	Designated features					
	Subtidal coarse sediment			Subtidal mixed sediments		
Potential pressures	**A**	**B**	**T**	**A**	**B**	**T**
Abrasion/disturbance of the substrate on the surface of the seabed						
Changes in suspended solids (water clarity)						
Collision below the water						
Deoxygenation						
Hydrocarbon and PAH contamination.						
Introduction of microbial pathogens						
Introduction or spread of invasive non-indigenous species						
Litter						
Nutrient enrichment						
Organic enrichment						
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion						
Physical change (to another seabed type)						
Physical change (to another sediment type)						
Removal of non-target species						
Removal of target species						
Smothering and siltation rate changes						
Synthetic compound contamination						
Transition elements and organo-metal contamination						

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 described by section 126 of the Marine and Coastal Access Act 2009[3].

Table 3 shows the fishing activities and pressures identified in Part A which have been included for assessment in Part B. The most relevant attributes of the designated features that could be compromised by fishing pressures were identified using the West of Wight-Barfleur MPA conservation advice package and are shown in **Table 4**.

Table 4: Relevant favourable condition targets for identified pressures of all site features.

Attribute	Target	Relevant pressures
Extent and distribution: Sediment composition and biological assemblages	Objectives have not been set for these attributes.	• 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. • Removal of non-target species. • Removal of target species. • Smothering and siltation rate changes.
Structure and function: Characteristic communities		
Structure and function: Key and influential species		
Structure and function: Sediment composition		
Supporting processes: Water quality		

4.1 Fisheries access and existing management

Non-UK vessels can operate within West of Wight-Barfleur MPA, provided that they have a licence issued by the UK to do so. VMS records indicate that flag states of vessels operating within the MPA from 2016 to 2021 included Belgium, France, Denmark, Germany, Ireland, The Netherlands and the UK. French vessels using demersal trawls accounted for the majority of VMS records in the site during this period.

More information on non-UK vessel access to UK waters can be found on MMO's Single Issuing Authority page[8].

4.2 Fishing activity summary

Table A1. 1 to **Table A1. 8** in **Annex 1** display a detailed breakdown of fishing activity within West of Wight-Barfleur MPA. The following analysis considers only fishing activities not screened out in Part A of this assessment; midwater and shore-based gears are therefore not examined here. Unless otherwise stated, figures cover fishing activity attributed to West of Wight-Barfleur MPA between 2016 and 2020, apart from VMS records of over 12 m vessel activity (**Table A1. 1**), and under 12 m vessel effort data (**Table A1. 8**), both of which cover 2016 to 2021. When discussing weights from landings in this section, figures used are a total of weights from UK and EU member state vessels.

The highest weight of landings of any gear type attributed to the site were from traps deployed by over 12 m vessels, with landings between 2016 and 2019 ranging from 30.13 to 34.95 tonnes (t). In 2020 landings were greatly diminished, at 7.31 t, likely due to the impacts of COVID-19, lowering the average annual landings weight to 27.49 t. Of the VMS records of vessel activity in the site, 29 % are attributed to vessels over 12 m in length using traps, with activity spread throughout the West of Wight-Barfleur MPA, but most concentrated in the south-west and north-east corners of the site, across both designated sediment features.

From VMS records, demersal trawls were the gear group operating most frequently in the MPA, with an average of 207 records annually, with the majority of activity attributed to bottom otter trawls. However, over 12 m vessels using this gear group landed lower weights of catch than those employing traps, with approximately 22 t of landings on average per year. The total catch weight for these vessels generally trended downwards from a peak of 28.08 t in 2016 to 19.66 t in 2020. VMS activity shows that demersal trawling activity occurred throughout the MPA, however this was more concentrated in the north-western corner of the site, and in a diagonal strip

[8] The UK Single Issuing Authority: www.gov.uk/guidance/united-kingdom-single-issuing-authority-uksia (Last accessed on: 26 July 2023).

between the MPA's north-west and south-east corners - again, covering both designated sediment features of the site.

Swept area ratio (SAR) analysis for 2016 to 2020, indicates that average annual surface SAR values for demersal trawl activity in C-squares intersecting West of Wight-Barfleur MPA ranged between 0.92 and 1.60. An SAR value of 1 means that each area C-square experiences a pass of fishing gear on average once a year. Average surface values for all bottom towed gears considered together for the period under consideration were between 0.92 to 1.83, with subsurface values between 0.09 and 0.16.

In addition to demersal trawl and trap activity, VMS records show an annual average of three records of demersal seine use and fewer than one record of dredge use per year for vessels over 12 m in length. Correspondingly, landings weights averaged 1.69 t for demersal seines and 0.01 t for dredges annually. From the limited data available, demersal seine usage occurred in the west of the site and scattered dredge use largely occurred in the far east.

During the period under consideration, there were no VMS records or landings data showing vessels over 12 m employing anchored nets and lines within West of Wight-Barfleur MPA.

For vessels under 12 m in length, landings data have been used to determine activity in the absence of VMS records. These data are recorded at ICES rectangle level and have been attributed to West of Wight-Barfleur MPA based on the proportion of ICES rectangle 29E7 intersected by the MPA (3.46 %). Because of this, there are limitations on the accuracy of this data, as it is only possible to estimate how much activity occurred in the MPA based on the average activity across the entire ICES rectangle, rather than at specific locations within the site.

Landings data indicates that activity for vessels under 12 m followed the trend of larger vessels, with the majority of landings by weight attributed to traps, followed by demersal trawls, in particular bottom otter trawls. For traps, landings averaged approximately 4 t per year, with annual totals ranging from 2.81 t in 2016 to 6.76 t in 2018. Fishing effort recorded by UK vessels under 12 m averaged approximately 11 days annually, for the period under consideration.

Bottom otter trawl landings for under 12 m vessels also peaked in 2018, with total landings of 2.46 t and an annual average of just over 1 t. Combined with other varieties of otter and beam trawls, the demersal trawl gear group as a whole averaged landings of 1.84 t annually, with these vessels averaging 4.59 days of fishing effort in the site between 2016 and 2021. In addition, the available data indicate that the under 12 m fleet also undertook very low levels of dredging, anchored net and line and demersal seine usage, with annual landings averaging 0.72 t, 0.35 t and 0.29 t respectively.

4.3 Pressures by gear type

The Stage 3 Fishing Gear MPA Impacts Evidence documents for anchored nets and lines[5], bottom towed gear[6] and traps[7] 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.

Impacts from target and non-target removal pressures have been scoped out from this assessment in most cases, as the detail of key structural and influential species is yet to be fully defined and they are assessed more completely within the abrasion and penetration pressures. These pressures may require consideration as a result of any future evidence review, in conjunction with updated conservation advice from JNCC. Where separate consideration of these pressures is required, this has been stated.

4.3.1 Anchored nets and lines

The relevant pressures on the subtidal sediment features of West of Wight-Barfleur MPA from anchored nets and lines were identified in **Table 3** and are:

- abrasion or disturbance of the substrate on the surface of the seabed;
- removal of non-target species; and
- removal of target species.

As noted in **section 4.3**, impacts from target and non-target removal pressures have been scoped out from further assessment, as they are assessed more completely within the abrasion pressure. Where separate consideration of these pressures is required, this has been stated.

Section 4.2 describes the fishing activity within the site and shows a limited amount of activity from vessels using anchored nets and lines within West of Wight-Barfleur MPA. Indeed, between 2016 and 2021 there were no VMS records of over 12 m

vessels employing this gear group, and between 2016 and 2020 under 12 m vessels landed 0.35 t of catch on average annually.

Impacts on sediment features relating to abrasion or disturbance of the substrate on the surface of the seabed occur primarily from the footrope and anchors during the hauling of this gear, and during movement along the seabed due to tides, currents, or storms. Abrasion impacts are considered likely to be greatest on subtidal mixed and coarse sediments as the coarser habitats often contain populations of sessile epifauna. However, as per section 9.3 of the anchored nets and lines Impacts Evidence document[5], abrasion impacts from this gear type are unlikely to negatively impact the extent or distribution of any sediment feature or structure and function of the ecosystem in a significant manner. Subtidal sediment habitats are considered resilient to all but intense fishing activity using anchored nets and lines on species rich sediment habitats or those with long-lived bivalves.

Relevant biotopes, described as characteristic of the subtidal coarse sediment and subtidal mixed sediments features for the Eastern Channel bioregion, have been identified in the correlation tables of JNCC's marine habitat classification system (JNCC, 2018, 2023; Tillin et al., 2020). These biotopes, their sensitivity to relevant pressures and the screening criteria used, are summarised in **Annex 2** in **Table A2**. **1** and **Table A2. 2.**

The Marine Life Information Network (MarLIN) ratings for sensitivity, resilience and resistance were then used to screen for biotopes potentially sensitive to pressures exerted by anchored nets and lines. Identified biotopes and their relevance to the assessment of West of Wight-Barfleur MPA are set out in **Table A2**. **1** and **Table A2. 2.** Of the 23 biotopes identified, 12 are found in habitats shallower than 30 m - these have been screened out, as the site is between 50 m and 100 m in depth[1] Taking a precautionary approach, five biotopes found at depths of up to 50 m were not screened out due to their potential presence in shallower areas of the site. Of the 11 remaining biotopes, nine have been screened out due to MarLIN profiles describing 'low' or 'no' sensitivity and 'high' resilience to the abrasion pressure.

The two remaining biotopes are associated with the subtidal mixed sediments feature. Both '*Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment', and '*Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment' exhibit 'medium' sensitivity and 'medium' resilience to abrasion. In sessile epifauna that characterise these biotopes, while the potential for significant damage by static gears is low, recovery of these habitats may be slower than life history traits of the species present predict (Roberts et al., 2010) and slow recovery from damage could result in significant effects if activity levels are high and sustained for long periods of time (Collie, Hermsen and Valentine, 2009). For both biotopes, MarLIN profiles note that resilience to abrasion is likely to be high in all but instances where impacts have caused significant mortality or the removal of the majority of the population of characterising species, the spatial scale of the pressure footprint is large enough to affect recruitment or the frequency of disturbance is

particularly high (De-Bastos *et al.*, 2023; Readman and Watson, 2024). Given the low levels of anchored net and line usage in the site, the small footprint of this gear group and that recovery of these biotopes is likely to be rapid if there are adjacent populations able to recolonise affected areas, these thresholds are unlikely to be exceeded. Likewise, both biotopes are at the limit of their natural depth range at 50 m; while communities could be present, this has not been verified by survey data.

There is currently little interaction occurring between anchored net and line activity and the designated sediment features of West of Wight-Barfleur MPA and the risk of significant impacts from the 'abrasion and disturbance' pressure is considered to be low.

Therefore, **MMO concludes 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 the MPA.**

4.3.2 Bottom towed gear

The relevant pressures on the subtidal sediment features of West of Wight-Barfleur MPA from bottom towed gear were identified in **Table 3** 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;
- removal of non-target species;
- removal of target species (dredges only); and
- smothering and siltation rate changes.

As noted in **section 4.3**, impacts from target/non-target removal pressures have been scoped out from further assessment, as they are assessed more completely within the 'abrasion' and 'penetration' pressures. Likewise, 'abrasion' and 'penetration' pressures have been consolidated, due to the similar nature of their impacts on sediment features. Where there are differences between the features or the potential impacts of different gears within each grouping, this has been highlighted.

The abrasion and penetration pressures caused by bottom towed gears have both biological and physical impacts to sediment features, varying based on levels of activity and fishing intensity, as described in section 8.4.1 of the bottom towed gear Impacts Evidence document[6]. Physical impacts range from the creation of furrows and berms in the sediment, to the flattening of bottom features such as ripples and the homogenisation of sediments.

Biological impacts include damage and mortality to flora and fauna on the seabed via surface and subsurface abrasion and penetration, as well as long term shifts in biological communities towards smaller, short-lived, opportunistic species that exhibit greater resilience to anthropogenic activity. Communities in subtidal coarse sediment and subtidal mixed sediments can be particularly sensitive to bottom towed gear

activity because they generally contain large proportions of long-lived and sessile epifauna which are easily damaged or removed by the pass of bottom towed gears leading to reduced diversity, abundance and occurrence.

As per **section 4.3.1**, characteristic biotopes of the subtidal coarse sediment and subtidal mixed sediments features of the site's bioregion were identified in JNCC's marine habitat classification system (JNCC, 2018, 2023; Tillin et al., 2020) and considered against pressures exerted by bottom towed gear using MarLIN sensitivity assessments. These biotopes, and the screening process described below, are set out in **Annex 2** in **Table A2**. **1** and **Table A2. 2**. Again, 23 biotopes were identified, with 12 biotopes screened out due to the depth range of the site, and five biotopes with a maximum habitat depth of 50 m precautionarily included. Of the 11 remaining biotopes, seven are described as experiencing 'low' or 'no' sensitivity to the pressures of abrasion and penetration and are therefore not considered further in this assessment.

The remaining four biotopes with 'medium' sensitivity and resilience to abrasion and penetration are '*O. fragilis* and/or *O. nigra* brittlestar beds on sublittoral mixed sediment'; '*F. foliacea* and *H. falcata* on tide-swept circalittoral mixed sediment'; '*N. mixta* in circalittoral shell gravel or coarse sand'; and '*Branchiostoma lanceolatum* in circalittoral coarse sand with shell gravel' (De-Bastos *et al.*, 2023; Tillin and Watson, 2023a; Tyler-Walters, Durkin and Watson, 2023; Readman and Watson, 2024).

For the mixed sediment biotopes, '*O. fragilis'* and '*F. foliacea'*, MarLIN profiles note that penetrating gear may adversely affect populations, removing and damaging deep buried species and that damage caused by abrasion and entanglement of epifaunal species can build incrementally. Resilience is likely to be high in all but instances where impacts have caused significant mortality or the removal of the majority of the population of characterising species (De-Bastos *et al.*, 2023; Readman and Watson, 2024). However, MarLIN notes the sensitivity of infaunal and epifaunal communities in brittlestar beds to repeated abrasion and penetration from fishing, where removal or displacement of the substrata is possible, leading to potential loss or severe damage to the biotope over time (De-Bastos *et al.*, 2023).

Likewise, the recruitment processes of echinoderms like '*N. mixta'* can be sporadic, meaning that penetrative gear may cause long term adverse effects on populations that characterise this biotope, with variable rates of recruitment and repopulation after damage or removal (Tyler-Walters, Durkin and Watson, 2023). Though evidence for sensitivity to below surface abrasion and penetration of the keystone species '*B. lanceolatum*' in that biotope is limited, some robustness is suggested by the species' ability to survive dredging to gather live samples for scientific study, but rates of repopulation are again uncertain. Similarly, the sensitivity of other species within the '*B. lanceolatum*' biotope that are able to recolonise less rapidly (such as *Glycera* spp.) or are more fragile (such as *Echinocyamus pusillus*) is likely to be higher (Tillin and Watson, 2023a).

High levels of natural disturbance may mean that the effects of ‘abrasion’ and ‘penetration’ pressures are limited on the physical structure of sedimentary habitats. However, while the relative resilience of biological communities on sandy sedimentary habitats could be due to natural disturbance, there is also evidence that use of bottom towed gear can result in shifting baselines for biological communities from lower resilience, long-lived, slowly recruiting fauna to more resilient opportunistic, short-lived, faster reproducing species (Hiddink et al., 2017; Plumeridge and Roberts, 2017; Josefson et al., 2018).

As noted in section 8.4.2 of the bottom towed gear Impacts Evidence document[6], the pressures ‘smothering and siltation rate changes’ and ‘changes in suspended solids’ occur when bottom towed gear connects with the seabed, causing the top layer of sediment to mix with the surrounding water. Sediments and faunal communities react differently to these pressures depending on grain size, the degree of sediment impaction and frequency/severity of the pressure upon them. The most sensitive characterising biotope of West of Wight-Barfleur MPA’s sediment features that prefer habitats likely to be found within the site is the ‘*O. fragilis*’ biotope, discussed above in relation to abrasion and penetration pressures, which shows ‘medium’ sensitivity to ‘smothering and siltation rate changes’ (De-Bastos *et al.*, 2023).

While at certain levels of intensity this pressure has the potential to impact on the species of a site, communities that live in sediment habitats will be adapted to some level of sedimentation in accordance with rates of natural disturbance. Given the high current velocities of the western central portion of the English Channel (James et al., 2007), it is likely that biological communities that predominate in the site are acclimatised to some level of disturbance and variation in water conditions due to the hydrodynamic regime, and that any increased sediment load in the water column would be quickly dispersed. However, as noted previously, the presence of more resilient biotopes cannot be untethered from potential changes to the community structure caused by these species dominating in areas regularly disturbed by fishing activity over less resilient biotopes, alongside the effects of natural hydrodynamic processes on community composition (Hiddink et al., 2017; Plumeridge and Roberts, 2017; Josefson et al., 2018).

Overall, MMO considers that the ‘abrasion’ and ‘penetration’ pressures caused by bottom towed gear will affect the extent, distribution and structure of biological communities of the MPA to the extent that the conservation objectives of the site are hindered. It is possible that ‘smothering, siltation rate changes’ could also have an effect, but on their own this pressure would be probably insufficient to hinder the conservation objectives of the MPA.

With regards to the discussion above, the assessed activity levels and the evidence available for the impact of bottom towed gears, **MMO concludes that there is a significant risk of the ongoing use of bottom towed gear over the subtidal coarse sediment and subtidal mixed sediments features hindering the achievement of the conservation objectives for the MPA.**

4.3.3 Traps

The relevant pressures on the subtidal sediment features of West of Wight-Barfleur MPA from traps were identified in **Table 3** and are:

- abrasion or disturbance of the substrate on the surface of the seabed;
- removal of non-target species; and
- removal of target species.

As noted in **section 4.3**, impacts from target/non-target removal pressures have been scoped out from further assessment, as they are assessed more completely within the abrasion pressure.

As **section 4.2** describes above, annually there were an average of approximately 89 VMS records of over 12 m vessels using traps within West of Wight-Barfleur MPA between 2016 and 2021, and between 2016 and 2020 landings for all vessels averaged 31.64 t.

Relevant characteristic biotopes for the traps gear group, identified in the correlation tables of JNCC's marine habitat classification system, alongside the likelihood that they might be found within the site (JNCC, 2018, 2023), are the same as those set out in **section 4.3.1** for anchored nets and lines. These biotopes and screening criteria are set out in **Annex 2** in **Table A2. 1** and **Table A2. 2.**

As before, the resilience to the abrasion pressure of the two highest sensitivity biotopes potentially present within the site ('*F. foliacea* and *H. falcata* on tide-swept circalittoral mixed sediment' and '*O. fragilis* and/or *O. nigra* brittlestar beds on sublittoral mixed sediment') is described by MarLIN to be high in all but instances where impacts cause significant mortality or the removal of the majority of the population of characterising species (De-Bastos *et al.*, 2023; Readman and Watson, 2024).

As outlined in the traps Impacts Evidence document[7], traps and associated lines and anchors may cause abrasion of subtidal sediments during setting and retrieval of gear, as well as from movement of set gear on the seabed as a result of storms, tides or currents. There is little primary evidence on the physical impact of traps on subtidal sediments, and the footprint of traps is likely to be small (Roberts et al., 2010). The evidence that is available indicates that traps are not likely to be a concern unless used at particularly high levels of intensity, or if particularly sensitive species are present.

Fishing effort and landings data indicate that interactions between traps and the designated features are occurring, so there is a risk of the 'abrasion and disturbance' pressure impacting on sediments within the site. However, a combination of the small footprint of this gear group (Roberts et al., 2010), and that there is minimal primary evidence of negative impacts of traps on sediment habitats, mean that the described activity levels are unlikely to be of a concern.

Therefore, **MMO concludes that the ongoing use of traps at the level described does not pose a significant risk of hindering the achievement of the conservation objectives of the subtidal coarse sediment, or subtidal mixed sediments features of the MPA.**

4.4 Part B conclusion

The assessment of anchored nets and lines, and traps on subtidal coarse sediment and subtidal mixed sediments features of West of Wight-Barfleur MPA has concluded that these fishing activities will not result in a significant risk of hindering the achievement of the conservation objectives. As such MMO concludes that management measures to restrict fishing activities using anchored nets and lines, and traps are not required in West of Wight-Barfleur Reef MPA based on the activity levels described; significant changes in activity levels may mean that a review of this assessment is required.

The assessment of bottom towed gear on the designated features in West of Wight-Barfleur Reef MPA has revealed activities may result in a significant risk of hindering the achievement of the conservation objectives of the MPA on subtidal coarse sediment and subtidal mixed sediments features. Management measures will therefore be implemented for bottom towed gear to ensure that there is no significant risk of hindering the conservation objectives of West of Wight-Barfleur MPA.

Section 6 contains further details of these measures.

5 Part C - In-combination assessment

Part C 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, which have the same 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.

Bottom towed gear was identified in Part B as requiring management to avoid a significant risk of hindering the achievement of the conservation objectives of West of Wight-Barfleur MPA. Anchored nets and lines and traps are therefore the only remaining gear groups able to operate within West of Wight-Barfleur MPA that interact with the seabed. In-combination effects of these fishing activities with each other, as well as in combination with other relevant activities, will therefore be assessed in Part C.

In accordance with the methodology detailed above, no other relevant activities were identified within West of Wight-Barfleur MPA or the applied 5 km buffer. While there may be operational submarine cables within this MPA, these cables are already in-situ and are unlikely to have any residual abrasion 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 activity.

Table 3 from **section 3.3** was used to identify medium-high risk pressures exerted by fishing activities to identify those which require in-combination assessment (**Table 5**).

Table 5 summarises the pressures exerted by fishing activities and identifies those exerted by all gears (Y: pressure exerted). Activity-pressure interactions are highlighted dark blue to illustrate an in-combination effect. Only fishing activities with no proposed or current fisheries management in place are considered.

Table 5: Pressures exerted by fishing activities.

	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 pressures

The in-combination 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

As noted in **section 4**, impacts from the removal of target and non-target species pressure are 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.

As **section 4.2** describes, all fishing activity using anchored nets and lines within the site can be attributed to under 12 m vessels. Between 2016 and 2021 the estimated annual average fishing effort for West of Wight-Barfleur MPA from UK vessels under 12 m using static gear totalled approximately 12 days, with 11 fishing effort days for traps and 1 day for anchored nets and lines (**Table A1. 8**). Between 2016 and 2020, the annual landings average for all under 12 m vessels using either gear group totalled 4.51 t, with 4.16 t for traps and 0.35 t for anchored nets and lines (**Table A1. 5** and **Table A1. 6**).

Fishing activity for over 12 m vessels using static gear within the site was limited, with an annual average of 89 VMS records of vessels using traps within the MPA between 2016 and 2021, and no records for anchored nets and lines (**Table A1. 1**). Landings for over 12 m vessels averaged 27.49 t annually between 2016 and 2020, with this figure diminished by lower than usual landings (7.31 t) in 2020, likely due to the impacts of COVID-19.

As discussed in **section 4.3** the features subtidal coarse sediment and subtidal mixed sediments are of low sensitivity to impacts from static fishing gears. Relevant biotopes, described as characteristic of these designated features for the Eastern Channel bioregion, have been identified in the correlation tables of JNCC's marine habitat classification system (JNCC, 2018, 2023; Tillin et al., 2020). These biotopes, their sensitivity to relevant pressures and the screening criteria used, are summarised in **Annex 2** in **Table A2**. **1** and **Table A2. 2**. The majority of these biotopes are described by MarLIN as not relevant to the habitats found with the MPA, or as having 'no' or 'low' sensitivity and 'high' resilience to the 'abrasion or disturbance' pressure (**Annex 2**).

Two biotopes which exhibit 'medium' sensitivity and 'medium' resilience to abrasion are associated with the subtidal mixed sediments feature: '*F. foliacea* and *H. falcata* on tide-swept circalittoral mixed sediment', and '*O. fragilis* and/or *O. nigra* brittlestar beds on sublittoral mixed sediment'. For both biotopes, MarLIN profiles note that resilience to abrasion is likely to be high in all but instances where impacts have caused significant mortality or the removal of the majority of the population of characterising species, the spatial scale of the pressure footprint is large enough to affect recruitment or the frequency of disturbance is particularly high (De-Bastos et al., 2023; Readman and Watson, 2024). Given the described activity levels for anchored net and line and trap usage in the site, the small footprint of these gear groups and that recovery of these biotopes is likely to be rapid if there are adjacent populations able to recolonise affected areas, these thresholds are unlikely to be exceeded. Likewise, both biotopes are at the limit of their natural depth range at 50 m; while communities could be present, this has not been verified by survey data.

The cumulative 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' on the designated features of West of Wight-Barfleur MPA. A precise understanding of spatial overlap of these two gear groups is not possible, as VMS data showing the location of fishing activity is only

available for over 12 m vessels, which employed traps but not anchored nets and lines during the period under consideration. Likewise, there are limits on the accuracy of apportioned ICES rectangle level landings data used for under 12 m vessels, which assume that fishing activity occurred evenly across the entirety of ICES rectangle 29E7, only 3.46 % of which is intersected by the MPA. Nevertheless, the combined pressure from these fishing gears, even if fully overlapping, would likely not be at an intensity which could undermine the condition of the features, given the sensitivity of the component biotopes and the activity levels under consideration here.

Traps and anchored net and line activity in combination at the levels described in this assessment therefore are not likely to cause an intensity of fishing within the site that would significantly increase the risk to designated features from abrasion. **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 West of Wight-Barfleur MPA at the levels described.**

5.3 Part C conclusion

MMO concludes that different fishing gear types in combination, and fishing in combination with other relevant activities will not result in a significant risk of hindering the achievement of the conservation objectives of West of Wight-Barfleur MPA.

Further management measures will not therefore be implemented for these gears within the site.

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 West of Wight-Barfleur MPA.

Part B of this assessment concluded that ongoing use of bottom towed gear on the sedimentary features of West of Wight-Barfleur MPA at the activity levels described may hinder the achievement of the conservation objectives of the MPA as a result of the impacts of abrasion or disturbance, penetration and smothering, removal of target and non-target species and siltation rate changes.

Part C of this assessment concluded that the ongoing use of anchored nets and lines and traps at the activity levels described, alone or in combination, does not pose a significant risk of hindering the achievement of the conservation objectives of West of Wight-Barfleur MPA.

To ensure that fishing activities do not result in a significant risk of hindering the conservation objectives of the MPA, MMO will implement a byelaw to prohibit the use of bottom towed gear throughout West of Wight-Barfleur 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[4].

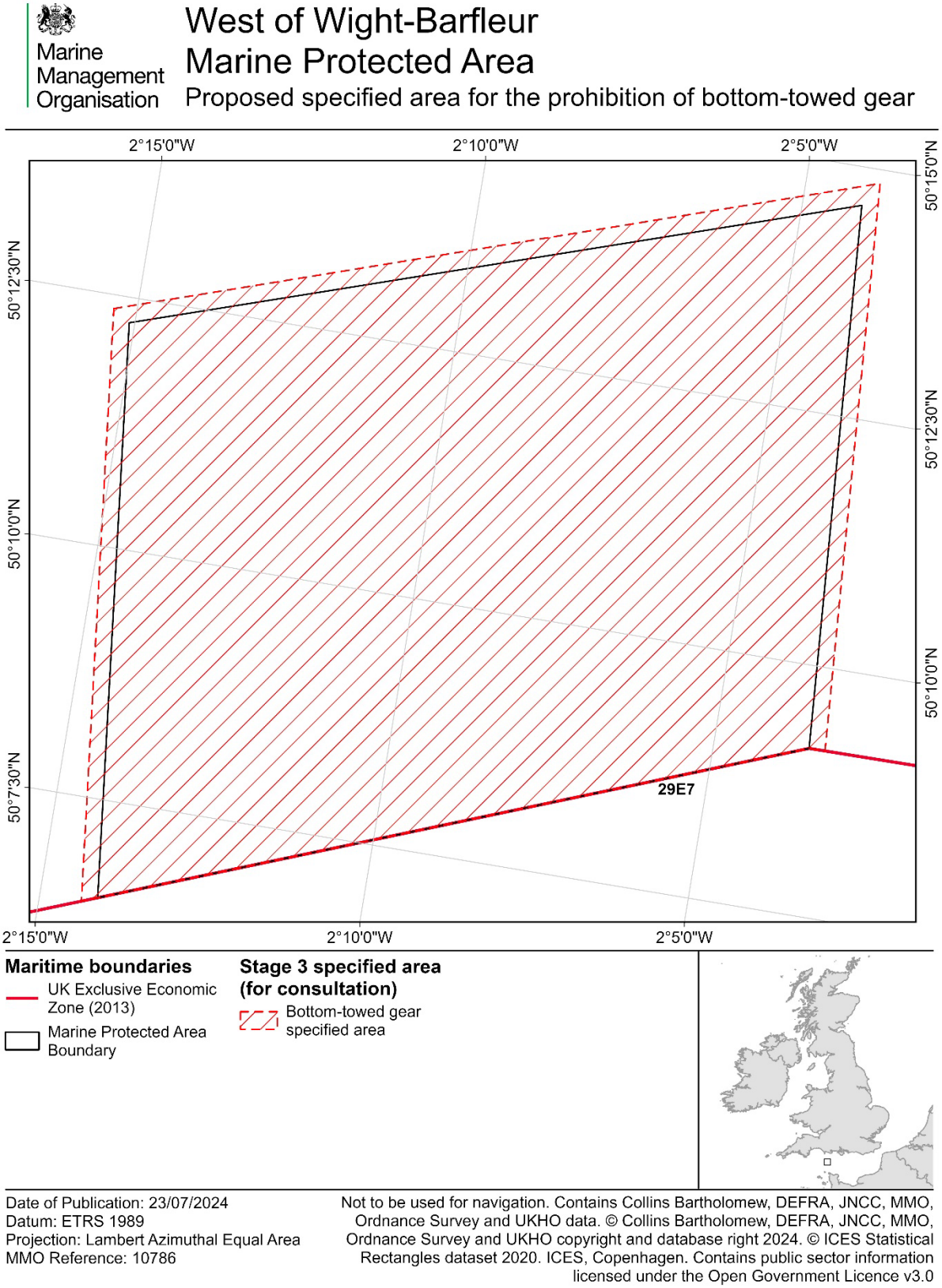


Figure 2: Map of proposed management.

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); and
- 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

Collie, J.S., Hermsen, J.M. and Valentine, P.C. (2009) 'Recolonization of gravel habitats on Georges Bank (northwest Atlantic)', *Deep Sea Research Part II: Topical Studies in Oceanography*, 56(19–20), pp. 1847–1855.

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., Sciberras, M., Szostek, C.L., Hughes, K.M., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Mazor, T., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. and Kaiser, M.J. (2017) 'Global analysis of depletion and recovery of seabed biota after bottom trawling disturbance', *Proceedings of the National Academy of Sciences of the United States of America*, 114(31), pp. 8301–8306. doi:10.1073/pnas.1618858114.

James, J.W.C., Coggan, R.A., Blyth-Skyrme, V.J., Morando, A., Birchenough, S.N.R., Bee, E., Limpenny, D.S., Verling, E., Vanstaen, K., Pearce, B., Johnston, C.M., Rocks, K.F., Philpott, S.L. and Rees, H.L. (2007) *The Eastern English Channel Marine Habitat Map*, *Science Series Technical Report no. 139*. Lowestoft. Available at: www.cefas.co.uk/publications/techrep/tech139.pdf.

JNCC (2018) *Marine Habitat Correlation Tables: Spreadsheet version (v.201801)*. Available at: https://mhc.jncc.gov.uk/resources/.

JNCC (2023) *Marine Habitat Classification for Britain and Ireland (22.04): Overview of changes since MHCBI 15.03*. Available at: https://hub.jncc.gov.uk/assets/f9a6a2be-e6be-4f7f-8605-28c1b4062658#2204-mhcbi-overview-of-changes.pdf.

Josefson, A.B., Loo, L.O., Blomqvist, M. and Rolandsson, J. (2018) 'Substantial changes in the depth distributions of benthic invertebrates in the eastern Kattegat since the 1880s', *Ecology and Evolution*, 8(18), pp. 9426–9438. doi:10.1002/ece3.4395.

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. and Tillin, H.M. (2006) '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. (2016) ‘Sabella pavonina with sponges and anemones on 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/1088.

Perry, F. and Watson, A. (2023) ‘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. (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.

Plumeridge, A.A. and Roberts, C.M. (2017) ‘Conservation targets in marine protected area management suffer from shifting baseline syndrome: A case study on the Dogger Bank’, *Marine Pollution Bulletin*, 116(1–2), pp. 395–404. doi:10.1016/j.marpolbul.2017.01.012.

Readman, J.A.J. (2016) ‘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. 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.

Roberts, C., Smith, C., Tilin, H. and Tyler-Walters, H. (2010) *Review of existing approaches to evaluate marine habitat vulnerability to commercial fishing activities*, *Environment Agency report: SC080016/R3*.

Tillin, H.M. (2016a) ‘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. (2016b) ‘Glycera lapidum, Thyasira spp. and Amythasides macroglossus in offshore 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/1136.

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., Hughes, E., Readman, J.A.J., Hiscock, K. and Last, E.K. (2020)

Assigning the EUNIS classifications to UK's Offshore Regional Seas, *JNCC Report No. 647*. Peterborough. Available at: https://hub.jncc.gov.uk/assets/34032043-c2d5-4fe4-952e-3bfe211ca6eb.

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) '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. (2023c) '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. (2023d) 'Mediomastus fragilis and cirratulids in infralittoral mixed sediment', in Tyler-Walters, H. (ed.) *Marine Life Information Network: Biology and Sensitivity Key Information Review*. Plymouth. Available at: www.marlin.ac.uk/habitats/detail/1260.

Tillin, H.M. and Watson, A. (2023e) '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. (2023f) '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. (2023g) '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 and EU Member States) and proportional activity (%), per gear, per gear group, per year (2016 to 2021), totals and annual average (2016 to 2021). 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	%	
Demersal seine	SDN	EU	4	100	0	0	0	0	0	0	0	0	3	100	7	100	1
	SDN total		**4**	**40**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**50**	**7**	**39**	**1**
	SSC	EU	1	17	0	0	0	0	0	0	1	100	2	67	4	36	<1
	SSC	UK	5	83	0	0	1	100	0	0	0	0	1	33	7	64	1
	SSC total		**6**	**60**	**0**	**0**	**1**	**100**	**0**	**0**	**1**	**100**	**3**	**50**	**11**	**61**	**2**
Demersal seine total			**10**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**6**	**2**	**18**	**1**	**3**
Demersal trawl	OTB	EU	268	100	175	100	186	100	230	100	160	100	212	100	1,231	100	205
	OTB total		**268**	**100**	**175**	**99**	**186**	**99**	**230**	**100**	**160**	**99**	**212**	**97**	**1,231**	**99**	**205**
	OTT	EU	0	0	0	0	0	0	0	0	2	100	4	100	6	100	1
	OTT total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**4**	**2**	**6**	**0**	**1**
	TBB	EU	1	100	1	100	1	100	0	0	0	0	2	100	5	100	<1
	TBB total		**1**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**1**	**5**	**0**	**<1**
Demersal trawl total			**269**	**71**	**176**	**70**	**187**	**60**	**230**	**61**	**162**	**83**	**218**	**72**	**1,242**	**68**	**207**
Dredge	DRB	EU	1	100	1	100	0	0	0	0	1	100	0	0	3	100	<1

Gear group	Gear code	Nation group	2016		2017		2018		2019		2020		2021		Total (2016 to 2021)		Average (2016 to 2021)
			Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	
	DRB total		**1**	**100**	**1**	**100**	**0**	**0**	**0**	**0**	**1**	**100**	**0**	**0**	**3**	**100**	**<1**
Dredge total			**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**3**	**0**	**1**
Midwater trawl	OTM	EU	3	100	0	0	0	0	0	0	0	0	0	0	3	100	<1
	OTM total		**3**	**75**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**20**	**<1**
	PTM	EU	1	100	2	100	6	100	3	100	0	0	0	0	12	100	2
	PTM total		**1**	**25**	**2**	**100**	**6**	**100**	**3**	**100**	**0**	**0**	**0**	**0**	**12**	**80**	**2**
Midwater trawl total			**4**	**1**	**2**	**1**	**6**	**2**	**3**	**1**	**0**	**0**	**0**	**0**	**15**	**1**	**3**
Traps	FPO	UK	96	100	71	100	115	100	143	100	32	100	78	100	535	100	89
	FPO total		**96**	**100**	**71**	**100**	**115**	**100**	**143**	**100**	**32**	**100**	**78**	**100**	**535**	**100**	**89**
Traps total			**96**	**25**	**71**	**28**	**115**	**37**	**143**	**38**	**32**	**16**	**78**	**26**	**535**	**29**	**89**
Unknown	NK	EU	0	0	0	0	1	100	0	0	0	0	0	0	1	100	0
	NK total		**0**	**0**	**0**	**0**	**1**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**100**	**0**
Unknown total			**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
Grand total			**380**	**1**	**250**	**0**	**310**	**0**	**376**	**1**	**196**	**0**	**302**	**0**	**1,814**	**0**	**303**

Table A1. 2: UK live weight landings tonnage (t) estimates by gear from vessels over 12 m in length in the MMO section of West of Wight-Barfleur MPA (2016 to 2020). All numbers are rounded to two decimal places.

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Demersal seine	SSC	5.05	0	1.42	0	0	6.47	1.29
Demersal seine total		**5.05**	**0**	**1.42**	**0**	**0**	**6.47**	**1.29**
Traps	FPO	31.60	30.13	33.45	34.95	7.31	137.44	27.49
Traps total		**31.60**	**30.13**	**33.45**	**34.95**	**7.31**	**137.44**	**27.49**
Grand total		**36.64**	**30.13**	**34.87**	**34.95**	**7.31**	**143.91**	**28.78**

Table A1. 3: EU27 live weight landings tonnage (t) estimates by gear from vessels over 12 m in length in the MMO section of West of Wight-Barfleur MPA (2016 to 2020). All numbers are rounded to two decimal places.

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Demersal seine	SDN	0.33	0	0	0	0	0.33	0.07
	SSC	0.88	0	0	0	0.79	1.67	0.33
Demersal seine total		**1.20**	**0**	**0**	**0**	**0.79**	**2.00**	**0.40**
Demersal trawl	OTB	27.73	17.38	19.62	25.31	19.41	109.44	21.89
	OTT	0	0	0	0	0.25	0.25	0.05
	TBB	0.36	0.32	0.32	0	0	1.00	0.20
Demersal trawl total		**28.08**	**17.69**	**19.94**	**25.31**	**19.66**	**110.69**	**22.14**
Dredge	DRB	0.02	0.01	0	0	0	0.04	0.01
Dredge total		**0.02**	**0.01**	**0**	**0**	**0**	**0.04**	**0.01**
Midwater trawl	OTM	50.62	0	0	0	0	50.62	10.12
	PTM	0.03	0.12	0.39	0.40	0	0.94	0.19
Midwater trawl total		**50.65**	**0.12**	**0.39**	**0.40**	**0**	**51.56**	**10.31**
Grand total		**79.96**	**17.82**	**20.33**	**25.72**	**20.46**	**164.28**	**32.86**

Table A1. 4: Percentage of the total ICES rectangle area intersected by the MMO section of West of Wight-Barfleur MPA. All numbers are rounded to two decimal places.

ICES rectangle	Percentage overlap (%)
29E7	3.46

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

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored net/line	GN	0.20	0.06	0	0.18	0.58	1.02	0.20
	GNS	0	0	0.01	0	0	0.01	<0.01
Anchored net/line total		**0.20**	**0.06**	**0.02**	**0.18**	**0.58**	**1.04**	**0.21**
Demersal trawl	OT	1.02	0.37	0	0	0	1.38	0.28
	OTB	0.01	0.52	2.46	1.85	0.52	5.37	1.07
	OTT	0	0	0.31	0.74	1.25	2.29	0.46
	TBB	0	0.04	0.03	0	0	0.07	0.01
Demersal trawl total		**1.03**	**0.93**	**2.79**	**2.59**	**1.77**	**9.11**	**1.82**
Dredge	DRB	0.14	0.89	1.00	0.91	0.56	3.51	0.70
Dredge total		**0.14**	**0.89**	**1.00**	**0.91**	**0.56**	**3.51**	**0.70**
Midwater gill encircling	GNC	0	0	0	0	0.49	0.49	0.10
Midwater gill encircling total		**0**	**0**	**0**	**0**	**0.49**	**0.49**	**0.10**
Midwater hook/line	HF	0.15	0.03	0	0	0	0.18	0.04
	LHP	0	0.09	0.02	0	0.06	0.17	0.03
	LX	0.28	0.14	0.14	0.14	0.11	0.81	0.16
Midwater hook/line total		**0.43**	**0.25**	**0.17**	**0.14**	**0.17**	**1.16**	**0.23**
Midwater trawl	OTM	0	0.01	0	0	0.06	0.08	0.02
Midwater trawl total		**0**	**0.01**	**0**	**0**	**0.06**	**0.08**	**0.02**
Traps	FPO	2.78	3.42	6.76	3	4.76	20.73	4.15
Traps total		**2.78**	**3.42**	**6.76**	**3**	**4.76**	**20.73**	**4.15**
Grand total		**4.59**	**5.56**	**10.74**	**6.82**	**8.41**	**36.11**	**7.22**

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

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored net/line	LLS	0.38	0.21	0.11	0.05	0	0.74	0.15
	GTR	0	0	0	0	0	0	0
Anchored net/line total		**0.38**	**0.21**	**0.11**	**0.05**	**0**	**0.74**	**0.15**
Demersal seine	SSC	0	0	0.10	1.01	0.33	1.44	0.29
Demersal seine total		**0**	**0**	**0.10**	**1.01**	**0.33**	**1.44**	**0.29**
Demersal trawl	OTB	0	0.05	0	0.03	0.01	0.09	0.02
Demersal trawl total		**0**	**0.05**	**0**	**0.03**	**0.01**	**0.09**	**0.02**
Dredge	DRB	0.09	0	0	0.03	0	0.12	0.02
Dredge total		**0.09**	**0**	**0**	**0.03**	**0**	**0.12**	**0.02**
Midwater gill drift	GND	0	0	0	0	0.04	0.04	0.01
Midwater gill drift total		**0**	**0**	**0**	**0**	**0.04**	**0.04**	**0.01**
Traps	FPO	0.03	0	0	0.01	0.02	0.06	0.01
Traps total		**0.03**	**0**	**0**	**0.01**	**0.02**	**0.06**	**0.01**
Grand total		**0.50**	**0.26**	**0.20**	**1.13**	**0.39**	**2.49**	**0.50**

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

Gear group	SAR category	2016	2017	2018	2019	2020
Bottom towed gear	Surface	1.83	0.92	1.09	1.54	1.60
	Subsurface	0.16	0.09	0.10	0.14	0.16
Demersal seine	Surface	0.32	0	0.11	0.03	0
	Subsurface	0.02	0	0.01	0.00	0
Demersal trawl	Surface	1.51	0.92	0.98	1.51	1.60
	Subsurface	0.14	0.10	0.09	0.14	0.16

Table A1. 8: Fishing effort (days) recorded by UK vessels under 12 m in length, separated by gear type for the area of West of Wight-Barfleur MPA that intersects the marine portion of ICES rectangle 29E7 (2016 to 2021). ICES rectangle level data has been apportioned to the MPA based on percentage area of the ICES rectangle that intersects the MPA (Table A1. 4). All numbers are rounded to two decimal places.

Gear group	Fishing effort (days at sea)							
	2016	2017	2018	2019	2020	2021	Total (2016 to 2021)	Average (2016 to 2021)
Demersal trawl	3.36	2.86	6.14	6.47	3.19	5.52	27.54	4.59
Dredge	0.24	2.13	1.14	0.92	0.33	0.35	5.12	0.85
Bottom towed gear total	**3.60**	**4.99**	**7.28**	**7.39**	**3.52**	**5.87**	**32.66**	**5.44**
Midwater gill encircling	0	0	0	0	0.03	0	0.03	0.01
Midwater trawl	0	0.03	0	0	0.10	0	0.14	0.02
Midwater hooks and lines	3.67	2.36	1.49	1.39	2.67	3.76	15.33	2.56
Midwater gear total	**3.67**	**2.39**	**1.49**	**1.39**	**2.81**	**3.76**	**15.51**	**2.58**
Traps	6.10	7.52	11.90	14.62	9.91	13.95	64.00	10.67
Anchored nets and lines	1.33	0.55	0.18	1.09	2.53	0.83	6.52	1.09
Static gear total	**7.43**	**8.08**	**12.07**	**15.72**	**12.44**	**14.78**	**70.52**	**11.75**
MPA total	**14.71**	**15.46**	**20.85**	**24.50**	**18.77**	**24.41**	**118.69**	**19.78**

Annex 2: Biotope screening

Table A2. 1: Subtidal coarse sediment biotopes.

Biotope name	Found at depth of site?	Sensitivity to relevant pressures
***Branchiostoma lanceolatum* in circalittoral coarse sand with shell gravel** (Tillin and Watson, 2023a)	Yes	Medium sensitivity to penetration
Glycera lapidum, *Thyasira* spp. and *Amythasides macroglossus* in offshore gravelly sand (Tillin, 2016b)		Low or no sensitivity
Hesionura elongata and *Protodorvillea kefersteini* in offshore coarse sand (Tillin and Ashley, 2016)		Low sensitivity
Mediomastus fragilis, *Lumbrineris* spp. and venerid bivalves in circalittoral coarse sand or gravel (Tillin and Watson, 2023c)		Low sensitivity
***Neopentadactyla mixta* in circalittoral shell gravel or coarse sand** (Tyler-Walters, Durkin and Watson, 2023)	Precautionarily included - maximum depth 50 m	Medium sensitivity to changes in suspended solids, penetration and removal of non-target species
Pomatoceros triqueter with barnacles and bryozoan crusts on unstable circalittoral cobbles and pebbles (Tyler-Walters, Tillin and Watson, 2024)		Low or no sensitivity
Sparse fauna on highly mobile sublittoral shingle (cobbles and pebbles) (Tillin, 2023)		Not sensitive
Protodorvillea kefersteini and other polychaetes in impoverished circalittoral mixed gravelly sand (Tillin and Watson, 2023g)	No - maximum depth 30 m	Not relevant to site due to habitat depth
Dense *Lanice conchilega* and other polychaetes in tide-swept infralittoral sand and mixed gravelly sand (McQuillan and Tillin, 2006)	No - maximum depth 20 m	
Glycera lapidum in impoverished infralittoral mobile gravel and sand (Tillin and Watson, 2023b)		

Biotope name	Found at depth of site?	Sensitivity to relevant pressures
Hesionura elongata and *Microphthalmus similis* with other interstitial polychaetes in infralittoral mobile coarse sand (Marshall, Ashley and Watson, 2023)	No - maximum depth 20 m	Not relevant to site due to habitat depth
Moerella spp. with venerid bivalves in infralittoral gravelly sand (Tillin and Watson, 2023e)		
Cumaceans and *Chaetozone setosa* in infralittoral gravelly sand (Tillin, 2016a)	No - maximum depth 10 m	

Table A2. 2: Subtidal mixed sediments biotopes.

Biotope name	Found at depth of site?	Sensitivity to relevant pressures
Mysella bidentata and *Thyasira* spp. in circalittoral muddy mixed sediment (De-Bastos, Marshall and Watson, 2023)	Yes	Low or no sensitivity
Polychaete-rich deep Venus community in offshore mixed sediments (Tillin and Watson, 2023f)		Low sensitivity
***Flustra foliacea* and *Hydrallmania falcata* on tide-swept circalittoral mixed sediment** (Readman and Watson, 2024)	Precautionarily included - maximum depth 50 m	Medium sensitivity to abrasion, penetration and removal of target and non-target species
***Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment** (De-Bastos *et al.*, 2023)		Medium sensitivity to abrasion, penetration, smothering and siltation rate changes and removal of non-target species
Cerianthus lloydii and other burrowing anemones in circalittoral muddy mixed sediment (Perry and Watson, 2024)	No - maximum depth 30 m	Not relevant to site due to habitat depth
Cerianthus lloydii with *Nemertesia* spp. and other hydroids in circalittoral muddy mixed sediment (Perry and Watson, 2023)		
Venerupis corrugata, Amphipholis squamata and *Apseudes holthuisi* in infralittoral mixed sediment (Tillin, Rayment and Watson, 2023)	No - maximum depth 30 m	Not relevant to site due to habitat depth
Crepidula fornicata with ascidians and anemones on infralittoral coarse mixed sediment (Readman, 2016)	No - maximum depth 20 m	
Sabella pavonina with sponges and anemones on infralittoral mixed sediment (Perry, 2016)		
Mediomastus fragilis and cirratulids in infralittoral mixed sediment (Tillin and Watson, 2023d)	No - maximum depth 10 m	