

Marine Management Organisation

MMO Stage 3 Site Assessment: Western Channel MPA (DRAFT)

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Title: MMO Stage 3 Site Assessment: Western Channel MPA DRAFT

Contents

Con	tents	1
Exe	cutive summary	1
1	Introduction	2
2	Site information	3
3	Part A - Identified pressures on the MPA	6
4	Part B - Fishing activity assessment	12
5	Part C - In-combination assessment	24
6	Conclusion and proposed management	28
7	Review of this assessment	30
Refe	erences	31
Ann	exes	33

Executive summary

This assessment analyses the impact of bottom towed gear, anchored nets and lines and traps on the designated features subtidal coarse sediment and subtidal sand in Western Channel 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 ongoing fishing activities by bottom towed gear occurring in the site on the designated features subtidal coarse sediment and subtidal sand pose a significant risk of hindering the achievement of the conservation objectives of Western Channel MPA. As such, the Marine Management Organisation (MMO) concludes that management measures are required.

1 Introduction

This assessment considers whether fishing activities are compatible with the conservation objectives of Western Channel 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, the Marine Management Organisation (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 in this assessment:

- JNCC Site Information Western Channel MCZ¹;
- <u>Defra Factsheet Western Channel MCZ²</u>.

Western Channel MPA is an offshore site located to the southeast of the Lizard Peninsula in Cornwall, approximately 54 kilometres (km) off the south coast of England (**Figure 1**). The site lies between two biogeographic regions, the Western Channel, and the Celtic Sea, and its southern boundary borders the UK Exclusive Economic Zone (EEZ) between England and France. The site covers an area of approximately 1,614 km^{2,} with depths ranging between 85 and 105 metres (m), and it is important to the connectivity of MPAs in the offshore regions of the UK and France.

Western Channel MPA was designated as a marine conservation zone (MCZ) in 2016, to protect the subtidal coarse sediment and subtidal sand features. The site exists in an area of continental shelf which is predominantly sandy, with a mixed distribution of coarse and mixed sediments. It is characterised by the presence of crescent-shaped sand waves, known as 'Barchan dunes', which result from the movement of wind predominately in one direction. These sand dunes provide supporting habitats for a diverse community of animal species, including echinoderms, such as sea urchins and starfish, bivalve molluscs, such as carpet shell clams and venus cockles, segmented worms, and sponges. Several crustacean and fish species, such as the Angler fish *(Lophius piscatorius)*, the small spotted cat shark *(Scyliorhinus canicula)*, sand eels, flat fish and cnidarians, including anemones, also inhabit this ecosystem. Foraging seabirds, seals and cetaceans also frequent the area. The designated features and their general management approaches are set out below in **Table 1**.

¹ JNCC Site Information – Western Channel MCZ: <u>www.jncc.gov.uk/our-</u> work/western-channel-mpa/ (last accessed 06 November 2023)

² Defra Fact Sheet – Western Channel MCZ: <u>www.gov.uk/government/publications/marine-conservation-zones-western-channel</u> (last accessed 06 November 2023)



Western Channel Marine Protected Area

Management Overview of site location and designated features Organisation



Date of Publication: 19/07/2024 Datum: ETRS 1989 Projection: Lambert Azimuthal Equal Area MMO Reference: 10786 Not to be used for navigation. Contains Collins Bartholomew, DEFRA, JNCC, MMO, Ordnance Survey and UKHO data. © Collins Bartholomew, DEFRA, JNCC, MMO, Ordnance Survey and UKHO copyright and database right 2024. © ICES Statistical Rectangles dataset 2020. ICES, Copenhagen. Contains public sector information licensed under the Open Government Licence v3.0

Figure 1: Site overview map.

The general management approaches for the features of Western Channel MPA have been set based on a vulnerability assessment. The attributes driving these approaches are described in JNCC's supplementary advice on conservation objectives¹.

Table 1: Designated features and general management approaches.

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

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. More information on this can be found in JNCC's supplementary advice on conservation objectives¹.

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 required by section 126 of the Marine and Coastal Access Act 2009³.

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.

³ For more information see: <u>www.legislation.gov.uk/ukpga/2009/23/section/126</u>.

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 <u>Stage 3</u> <u>MPA Site Assessment Methodology document</u>⁴, 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 records(2016 to 2021) and landings data (2016 to 2020) for Western Channel MPA.

Gear type	Gear name	Gear code	Justification		
	Combined gillnet-trammel net	GTN	Present in VMS records and under 12 m vessel landings		
Anchored nets and lines	Gill nets (not specified)	GN	data for ICES statistical rectangles that overlap the site.		
	Longlines (demersal)	LLS	Present in under 12 m vessel landings data for ICES statistical rectangles that overlap the site.		
	Set gillnet (anchored)	GNS	Present in VMS records and under 12 m vessel landings		
	Trammel net	GTR	rectangles that overlap the site.		
	Beam trawl	твв	Present in VMS records and under 12 m vessel landings data for ICES statistical		
	Bottom otter trawl	ОТВ	rectangles that overlap the site.		
Bottom towed	Danish / anchor seine	SDN	Present in VMS data.		
gear	Hand mechanised dredge	HMD	Present in under 12 m vessel		
	Otter trawls (unspecified)	ОТ	landings data for ICES		
	Scottish / fly seine	SSC	statistical rectangles that		
	Boat dredge	DRB	ovenap lite sile.		

⁴ Stage 3 MPA Site Assessment Methodology document: <u>www.gov.uk/government/publications/stage-3-site-assessments</u> (last accessed 20 September 2024).

Gear type	Gear name	Gear code	Justification
Bottom towed gear	Twin bottom otter trawl	отт	Present in VMS records and under 12 m vessel landings data for ICES statistical rectangles that overlap the site.
	Encircling gillnet	GNC	Present in under 12 m vessel
	Hand-operated pole-and-line	LHP	landings data for ICES
Midwater gear	Jigging or trolling line	LTL	overlap the site.
	Longlines (Midwater)	LLD	Propert in V/MS date
	Midwater otter trawl	ОТМ	Fresent in vivio data.
Traps	Pot/Creel	FPO	Present in VMS records and under 12 m vessel landings data for ICES statistical rectangles that overlap the site.
Miscellaneous	Not known	NK	Present in VMS data.

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 Western Channel MPA.

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

- **Midwater gears:** although the use of midwater gears does occur within Western Channel 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 Western Channel 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 the 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 Lines⁵;
- Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear⁶; and
- Stage 3 Fishing Gear MPA Impacts Evidence Traps⁷.

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

September 2024).

⁷ Stage 3 Fishing Gear MPA Impacts Evidence Traps:

⁵ Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines: www.gov.uk/government/publications/stage-3-impacts-evidence (last accessed 20)

⁶ Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear:

<u>www.gov.uk/government/publications/stage-3-impacts-evidence</u> (last accessed 20 September 2024).

<u>www.gov.uk/government/publications/stage-3-impacts-evidence</u> (last accessed 20 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, or that the feature is not
	sensitive to the pressure.

Table 3: Summary of pressures on designated features of Western Channel MPA to be taken forward to Part B.

	Designated Feature									
	Subtidal coarse sediment Subtidal sand									
Potential pressures	Α	В	Т	Α	В	Т				
Abrasion or disturbance of the substrate on the surface of the seabed										
Changes in suspended solids (water clarity)										
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 (light)										

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 2009³.

Table 3 shows the fishing activities and pressures identified in Part A which havebeen included for assessment in Part B. The most relevant attributes of thedesignated features that could be compromised by fishing pressures were identifiedusing the Western Channel MPA conservation advice package and are shown in**Table 4.**

Feature	Attribute	Target	Relevant pressures
	Extent and distribution	There are no targets	 abrasion or disturbance of the substrate on the surface of the seabed; changes in suspended solids (water clarity);
Subtidal coarse sediment and subtidal sand	Structure and function	available for the site in the JNCC supplementary advice on	 penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion; removal of non-target
	Supporting processes	conservation objectives ¹ .	 species; removal of target species and; smothering and siltation rate changes.

Table 4: Relevant	favourable of	condition	targets for	identified	pressures.
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4.1 Fisheries access and existing management

Non-UK vessels can operate within Western Channel 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, Spain, Ireland, Lithuania, the Netherlands and Norway. VMS records indicate that French vessels are most prevalent.

There are no management measures currently in place in Western Channel MPA.

4.2 Fishing activity summary

Table A1.1 to **Table A1.8** in **Annex 1** display a detailed breakdown of fishing activity within Western Channel MPA. Of the fishing activities not screened out in Part A of this assessment, the most prevalent gears operating within the site are demersal trawls, most notably bottom otter trawls.

Anchored Nets and Lines

Anchored nets and lines were the second most common fishing gear group used by vessels over 12 m within Western Channel MPA. VMS data showed the use of gillnets, including set gillnets (anchored), combined gillnets-trammel nets and trammel nets were the different types of anchored nets and lines used by these vessels, with an annual average of 2,303 VMS records, and an annual average landings weight of 238.87 tonnage (t). VMS records peaked in 2021 with 2,775 records documented; this activity is distributed throughout the whole site, with the exception of the site's far southeastern corner. Anchored net and lines were used to fish the least by vessels under 12 m in length, with average annual landings of 4.45 t between 2016 and 2020, and a total of 20.5 fishing effort days between 2016 and 2021. Under 12m vessel landings by anchored nets and lines have also decreased year on year from a total of 6.74 t in 2017 to 1.29 t in 2020. Although there was already a declining trend, landings in 2020 are likely also influenced by the COVID-19 restrictions.

Bottom Towed Gear

Demersal trawls were the most common type of bottom towed fishing gear used by vessels over 12 m within Western Channel MPA, with an annual average of 8,075 VMS records, 99 % of which are attributed to bottom otter trawling. Non-UK vessels accounted for most of this activity. In contrast, demersal seine use averaged 15 VMS records annually, with activity using this gear initially recorded in 2019. Only one VMS record for dredge activity was recorded within the six year period in 2021. Bottom towed gear activity for vessels over 12 m occurred throughout the site, with higher concentrations of activity in the north. Annual landings for vessels over 12 m using bottom towed gear to fish averaged 731.39 t.

Bottom towed fishing gear was also used by vessels under 12 m within Western Channel MPA, albeit to a far lesser extent compared to larger vessels. It is likely this can be attributed to the MPA being an offshore site. Annual landings from all types of bottom towed gear averaged 5.21 t between 2016 and 2020, of which 4.86 t resulted from dredging activity. Bottom towed fishing activity by non-UK vessels was limited during this period, with landings averaging 0.54 t. The UK under 12 m fishing activity occurred mainly in the eastern half of the MPA, with higher levels of effort in the north and northeast. For UK under 12 m vessels using bottom towed gear there was a total of 39.7 effort days in the period under consideration (2016 to 2021). Analysis of swept area ratio (SAR) showed that demersal trawl activity occurred throughout the five year period. A SAR value of 1 means that each area C-square experiences a pass of fishing gear on average once a year. Mean surface SAR values for C-squares intersecting Western Channel MPA ranged between 3.26 and 4.88, with an average of 4.30, and mean Subsurface SAR values ranged between 0.27 and 0.40, with an average of 0.36. In areas where trawling activity was notably more intense, some C-squares have surface SAR values as high as 20. Subjection of the site to contact with fishing gear four times per year on average indicates that levels of demersal trawling activity was high across the MPA.

Traps

Traps were the most productive gear type used by vessels under 12 m in length within Western Channel MPA, with annual average landings weighing 5.77 t. Most of the fishing activity using traps was conducted by UK vessels, with annual average landings of 5.74 t, compared to 0.03 t by non-UK vessels during the 2016 to 2020 period. Fishing effort data showed that there was a total of 34.2 fishing effort days between 2016 and 2021 for traps, with activity concentrated in the north and northeast of the site.

Traps were the least common fishing gear used by vessels over 12 m in length within the MPA, with VMS data showing an annual average of 1,304 records between 2016 and 2021. This fishing activity was distributed throughout the whole site, but activity levels were higher on the western half of the MPA. Average annual landings for fishing by traps were 61.19 t, with non-UK vessels accounting for the majority (96 %, 59.13 t) of these landings within the period described. Landings using traps by over 12 m vessels were only recorded for UK vessels in 2020, weighing 10.31 t.

4.3 Pressures by gear type

The Stage 3 Fishing Gear MPA Impacts Evidence documents for anchored nets and lines⁵, bottom towed gear⁶ and traps⁷ 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 sand have similar sensitivities to the pressures identified for different gear types, these features have been considered together as subtidal sediment features. 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 association 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 Western Channel MPA, and the detail of key structural and influential species is yet to be fully defined, we conclude that impacts from target/non-target removal can be scoped out from further assessment of this site. We acknowledge that these pressures may require consideration as a result of any future evidence review, in conjunction with updated conservation advice from JNCC.

Biotopes relevant to the sediment features within the Western Channel and Celtic Sea region were identified using the Biotope Presence-Absence spreadsheet from JNCC Report No.647 (Tillin et al., 2020), which lists European Nature Information System (EUNIS) biotopes that are present, likely to be present, or absent from each UK offshore bioregion based on survey data, environmental information, species records, literature and expert judgement. Biotopes were screened out if they were not located in the same bioregion as Western Channel MPA (Western Channel and Celtic Sea) and if they were not found at the depth range of the site (85 to 105 m). Depth ranges were listed in the Biotope Database of JNCC Report No. 647 (Tillin et al., 2020). In instances where this information was not available, depth data was retrieved from the biotope pages on <u>The Marine Life Information Network (MarLIN)</u>⁸. **Table 5** shows the remaining biotopes that could be present within Western Channel MPA that have at least medium sensitivity to the relevant pressures from anchored nets and lines, bottom towed gear, and traps.

⁸ MarLIN – EUNIS habitats list. <u>www.marlin.ac.uk/habitats/eunis</u> (last accessed 06 November 2023)

Table 5: Sediment biotopes with medium sensitivity to relevant pressures fromanchored nets and lines, bottom towed gear, and traps.

Feature	Biotope name	Sensitivity
	<i>Mediomastus fragilis, Lumbrineris</i> spp. and venerid bivalves in circalittoral coarse sand or gravel (Tillin and Watson, 2023c)	Sensitive to: smothering and siltation.
Subtidal coarse sediment	<i>Branchiostoma lanceolatum</i> in circalittoral coarse sand with shell gravel (Tillin and Watson, 2023a)	Sensitive to: • penetration.
	<i>Glycera lapidum, Thyasira</i> spp. and <i>Amythasides macroglossus</i> in offshore gravelly sand (Tillin and Watson, 2023b)	Sensitive to: smothering and siltation.
	<i>Echinocyamus pusillus, Ophelia borealis</i> and <i>Abra prismatica</i> in circalittoral fine sand (Tillin, 2022b)	Sensitive to: • removal of target
	<i>Abra prismatica</i> , <i>Bathyporeia elegans</i> and polychaetes in circalittoral fine sand (Tillin, 2022a)	 smothering and siltation.
Subtidal sand	Maldanid polychaetes and <i>Eudorellopsis deformis</i> in deep circalittoral sand or muddy sand (Ashley, 2016)	Sensitive to: abrasion; penetration; and smothering and siltation.
	<i>Owenia fusiformis</i> and <i>Amphiura filiformis</i> in deep circalittoral sand or muddy sand (De-Bastos, 2023)	 Sensitive to: abrasion; penetration; removal of non-target species; and smothering and siltation.

4.3.1 Anchored nets and lines

Subtidal sediment features

The relevant pressures on subtidal coarse sediment and subtidal sand of Western Channel 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 above, impacts from target/non-target removal pressures have been scoped out from this assessment, as they are assessed more completely within the abrasion and penetration pressures. Where separate consideration of these pressures is required, this has been stated.

Section 4.2 describes the fishing activity within Western Channel MPA and notes that anchored nets and lines are the second most common fishing gear type used by vessels over 12 m in length, with activity peaking in 2021. Combined landings for under and over 12 m vessels between 2016 and 2020 averaged 243 t, with activity levels increasing annually from 2017 onwards, except for a decrease in activity in 2020.

Abrasion impacts primarily occur during the deployment and retrieval of nets, and the associated ground lines and anchors, and due to their movement across the seabed during rough weather. However, according to **section 9.4** of the Anchored nets and lines Impacts Evidence document⁵, such interactions are usually minimal. Therefore, abrasion pressures from this gear type are unlikely to have a significantly negative impact on the extent or distribution of any sediment feature or the structure and function of the ecosystem, as 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. Static gears are also more likely to cause a negative impact on softer sediments such as subtidal mud and muddy sands (De-Bastos, 2023).

There is little information regarding the hydrodynamic activity in Western Channel MPA. However, the confirmed presence of the biotopes *Branchiostoma lanceolatum* in circalittoral coarse sand with shell gravel and *Caryophyllia smithii*, sponges and crustose communities on wave-exposed circalittoral rock, coupled with the presence of 'Barchan dunes' created by wind action across the site, suggest that it is a higher energy environment. Higher energy, coarser sedimentary habitats have greater recovery potential following impact than lower energy, finer sedimentary habitats (Dernie, Kaiser and Warwick, 2003). Both biotopes also have low sensitivity to abrasion pressures.

Table 5 identified four biotopes with medium sensitivity to abrasion pressures, all of which are found in subtidal sand sediments. Maldanid polychaetes and *Eudorellopsis deformis* in deep circalittoral sand or muddy sand is relatively protected from surface disturbance by its burrowing life habit and is thought that to have no sensitivity to surface abrasion from correctly deployed nets, weights and anchors (Ashley, 2016). Therefore, it is unlikely that pressures from anchored nets and lines would have an adverse impact on this biotope.

Conversely, the biotope Owenia fusiformis and Amphiura filiformis in deep circalittoral sand or muddy sand, is particularly sensitive to the abrasion pressure from all gears, including static gears, due to the fragility of the key species and the soft sediment where they occur (De-Bastos, 2023). However, the key species, such as Acrocnida brachiata and A. filiformis, that characterise this biotope are resilient and able to recover even from significant impacts from fishing activity (De-Bastos, 2023). Although this biotope is potentially found within the bioregion of Western Channel and Celtic Sea, there are currently no known records of it within Western Channel MPA. Therefore, when coupled with the known dominance of coarse sediments across the MPA, compared to soft, confidence in its presence is low. It must be acknowledged however that lack of data does not equate to confirmed absence. Potential does remain for it to be present, and risk of abrasion impacts cannot be completely ruled out. Echinocyamus pusillus, Ophelia borealis and Abra prismatica in circalittoral fine sand and Abra prismatica, Bathyporeia elegans and polychaetes in circalittoral fine sand are specifically sensitive to the pressure of removal of target species. However, this is predominantly a result of dredging activity and is, therefore, not relevant to this gear type (Tillin, 2022a, 2022b; De-Bastos, 2023).

The evidence collated on the impacts of anchored nets and lines within the Impacts Evidence documents⁵ suggests that subtidal sediments are likely to recover more slowly from damage from static gears if the activity levels are high and sustained for long periods of time. Despite the levels of interaction between anchored nets and lines and the seabed in Western Channel MPA described in this assessment, the scale of the footprint from this gear type is small. Thus, the risk of abrasion and disturbance is limited and unlikely to have an adverse effect on the designated subtidal sediment features and attributes laid out in **Table 4**.

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 Western Channel MPA.

4.3.2 Bottom towed gear

The relevant pressures on subtidal sediment features of Western Channel MPA from bottom towed gear were identified in **Table 3** and are:

abrasion or disturbance of the substrate on the surface of the seabed*;

- changes in suspended solids (water clarity)[∆];
- penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion*;
- removal of non-target species;
- removal of target species; and
- smothering and siltation rate changes (light)^Δ.

Pressures marked with matching superscript symbols ($^{\Delta}$ and *) have been consolidated due to the similar nature of their impacts on the sediment features.

Section 4.2 describes the fishing activity within Western Channel MPA, concluding that demersal trawls, most notably bottom otter trawls, were the most prevalent fishing gear used within the site. This activity occurred throughout the entire site, with intensity highest in the north of the MPA. SAR values also indicate that these gears sweep the entire site between three and five times per year. Dredging activity varied year on year but only occurred in the eastern half of the site throughout the period described, with highest concentrations of activity recorded in the north and northeast. This activity was mainly conducted by vessels under 12 m. However, when compared to demersal trawls, dredging activity was relatively low. Given subtidal sand sediments are interspersed within the subtidal coarse sediments throughout the site, bottom towed gear activity is likely to have occurred across both designated sediment features within Western Channel MPA.

According to **section 8.4** of the bottom towed gear Impacts Evidence document⁶, abrasion and penetration pressures from bottom towed gear can have both biological and physical impacts. Physical impacts from the use of bottom towed gear are more prevalent in subtidal mud compared to other sediments because they can penetrate the seabed more deeply and because mud habitats have higher physical stability. Of more concern to subtidal sand and subtidal coarse sediment habitats are the impacts to biological structure. Biological impacts that could occur 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. Furthermore, the close contact interaction between the fishing gear and seabed can also alter the habitat structure and attract short-term scavengers.

Communities that characterise subtidal coarse sediment are particularly sensitive to bottom towed gear activity because they generally contain large portions of longlived and sessile epifauna which are easily damaged by the pass of bottom towed gear leading to reduced diversity. The first pass of a trawl has the largest and most damaging initial impact on biomass and production of sediments, subsequent passes have smaller additional affects (Hiddink et al., 2006). This contributes to a shift in the biological community, removing the most sensitive species while allowing resilient organisms to remain (Hiddink et al., 2017), suggesting that infrequent trawling may be sufficient to maintain a community in an altered state. There is limited information on the impacts of bottom towed gear on subtidal sand, but 'clean' sand and 'well sorted' sediments generally appear to have greater resilience to, and recovery from, fishing disturbance, compared to subtidal coarse sediments.

One of the three subtidal coarse sediment biotopes shown in **Table 5**, *B. lanceolatum* in circalittoral coarse sand with shell gravel, has medium sensitivity to penetration. This biotope is also the only one to have been confirmed to be present within Western Channel MPA by JNCC during a community analysis conducted in 2016 (Jones, Parry and Wright, 2016). In the absence of direct evidence of mortality or damage to the characterising species, *B. lanceolatum*, or for its sensitivity, the assessment is based on expert judgement and the known fragility from research on a characterising species, *E. pusillus* (Tillin and Watson, 2023a).

The four subtidal sand biotopes in **Table 5** have medium sensitivity to abrasion and penetration pressures. Many of the characterising species in these biotopes exhibit shallow burrowing life habits, so are at risk of damage or removal from fishing gear that passes the seabed surface, collapsing their burrows or directly damaging their extended feeding appendages (Ashley, 2016; De-Bastos, 2023). *O. fusiformis* and *A. filiformis* in deep circalittoral sand or muddy sand is particularly sensitive to abrasion due to the fragility of the key species, with research demonstrating negative correlations between abundance of *A. filiformis* and increasing trawling activity (De-Bastos, 2023). Larger bivalve species associated with the subtidal sand biotopes of the site are likely to be removed by bottom towed gears and have the potential to be targeted by commercial fishers (Ashley, 2016; De-Bastos, 2023). The most efficient method used to target the removal of bivalves is dredges. However, the targeted fishing of these species can result in population declines and consequently reclassification of the biotopes, so resistance is low.

As highlighted in **Table 3**, subtidal coarse sediment and subtidal sand features are both sensitive to smothering and siltation pressures. Section 8.4.2 of the bottom towed gear Impacts Evidence document⁶ collates and documents best available research on the impacts of smothering and siltation to sediment features and finds that when there is an interaction between bottom towed fishing gear and the seabed, it causes the top layers of sediment to mix with the water, particularly around and behind the gear. Small particles are then entrapped in the ambient water, creating a suspension of particles, a cloud in the water column which will then settle. The amount of suspended sediment will depend on several contributing factors, including turbulence, gear type, sediment type, sediment grain size and the degree of sediment compaction. Research into smothering and siltation has been predominately conducted on subtidal sand and subtidal mud features, which have found that trawling over these substrates generated the resuspension of fine sediments, creating a sediment plume which can be carried up to over 1 km away. Even after fishing activity has stopped, plumes created by demersal trawling can persist for several days. Subtidal coarse sediments are a heterogeneous

environment made up of various sediments, including coarse sand, gravel, pebbles, shingle, and cobbles. It can therefore be assumed that impacts are likely to be similar to those described for other sediment features. Thus, changes in smothering and siltation rates resulting from fishing activity using bottom towed gear can negatively impact organisms within sensitive biotopes and alter the biological structure of key and influential species.

The impact of smothering and siltation on species is variable. Sedentary, filter or suspension feeders, such as bivalves, have low resistance to smothering, whereas mobile epifauna, mobile predators and scavengers appear highly resilient and resistant (Tillin and Tyler-Walters, 2014). The most sensitive group of species are very small to medium sized suspension and/or deposit feeding bivalves. Although this ecological group is not predicted to be sensitive to acute changes in turbidity, this may change if subjected to a chronic, sustained change.

Table 5 demonstrates that two subtidal coarse sediment biotopes, and four of the subtidal sand biotopes that could be found within Western Channel MPA have medium sensitivity to pressure from light smothering and siltation rate changes. The characterising bivalves within some of these biotopes require their siphons to remain above the surface to feed and respire, with research suggesting that they can survive between 10 and 50 cm of sediment resuspension (Ashley, 2016; Tillin, 2022a, 2022b; De-Bastos, 2023; Tillin and Watson, 2023b, 2023c). Conversely, polychaete species such as Maldane sarsi of the biotope Maldanid polychaetes and *E. deformis* in deep circalittoral sand or muddy sand are negatively impacted by deposition of up to 30 cm (Ashley, 2016), and Aphelochaeta marioni, associated with the biotope Glycera lapidum, Thyasira spp. and Amythasides macroglossus in offshore gravelly sand, are far less resilient, and can be compromised by an additional layer of sediment as small as 5 cm (Tillin and Watson, 2023b). Although many of the characterising species within these biotopes also have high sediment recolonisation rates and long lifespans, their growth rates are slow which limits their recovery potential. Moreover, the faster recovery rates of polychaete and amphipod species could result in alterations to the biotopes' classifications, causing them to become polychaete dominated. Subjection to repeated interaction with fishing gear is, therefore, likely to have an adverse impact on the MPA's biodiversity.

As discussed in **section 4.3.1**, it is likely that Western Channel MPA is a high energy environment. Therefore, species within the site are likely accustomed to some amount of turbidity and siltation. However, when coupled with the consistent passing of fishing gear or scour by objects on the seabed surface, it is possible to have accumulating effects, creating marked impacts on the substratum, causing localised increased turbidity in the water column, and smothering of biological communities. Prolonged changes in turbidity levels can alter the amount of light reaching the seabed, impacting the ecosystem of the site. Continuous suspended particulars in the water column can affect fish health clogging the filtering organs of suspension feeding animals and thus, further exacerbating seabed sedimentation rates. Brittlestar species, such as the *Acrocnida brachiate*, found within the *O. fusiformis* and *A. filiformis* in deep circalittoral sand or muddy sand biotope are particularly vulnerable to these effects and are unlikely to survive in areas subjected to persistent sedimentation (De-Bastos, 2023).

Although the first pass of a trawl has the largest and most damaging initial impact on biomass and production of sediments, causing high levels of mortality (Hiddink et al., 2006), subsequent passes have additional effects and consistent activity allow little time for species to recover. Moreover, bottom towed gear contacts a much larger area of the seabed than static gears meaning that they have an impact on a spatial scale much larger than anchored nets and lines or traps. The SAR levels for Western Channel MPA suggest that, on average, the site is being completely swept by bottom towed fishing gear between three and five times per year, and in some cases reaching maximum peak values of twenty. It is likely, therefore, that the sedimentary features of the MPA are regularly exposed to abrasion, penetration, and smothering pressures. Given many of the biotopes that make up the subtidal coarse sediment and subtidal sand features are sensitive to these pressures, such activity could hinder the ability to achieve the site's general management approach 'recover to favourable condition'.

Therefore, MMO concludes that the ongoing use of bottom towed gear poses a significant risk of hindering the achievement of the conservation objectives of the subtidal coarse sediment and subtidal sand features of Western Channel MPA.

4.3.3 Traps

Subtidal sediment features

The relevant pressures on subtidal sediment features of Western Channel 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.

Section 4.2 describes the fishing activity within Western Channel MPA and shows that traps were the least commonly used fishing gear, with combined annual average landings weighing 67 t and an annual average of 1,304 VMS records.

Section 9.4 of the traps Impacts Evidence document⁷, concludes that abrasion impacts from static fishing gears, including traps, are unlikely to be a concern unless they occur where particularly sensitive species are present or when fishing occurs at damaging levels of intensity. 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.

The relevant biotopes with medium sensitivity to abrasion pressures and potentially located within the MPA are identified in Table 5. O. fusiformis and A. filiformis in deep circalittoral sand or muddy sand, is particularly sensitive to the abrasion pressure from all gears, including static gears, due to the fragility of the key species and the soft sediment where they occur (De-Bastos, 2023). However, the species that characterise this biotope are known to recover guickly even from considerable impacts of fishing activity and Western Channel MPA is made up of coarse, more resilient sediments. Maldanid polychaetes and E. deformis in deep circalittoral sand or muddy sand is relatively protected from surface disturbance by its burrowing life habit and is thought that to have no sensitivity to surface abrasion from correctly deployed nets, weights and anchors (Ashley, 2016). Pressures from traps, therefore, are unlikely to have adverse effects on these biotopes. E. pusillus, O. borealis and A. prismatica in circalittoral fine sand and A. prismatica, B. elegans and polychaetes in circalittoral fine sand are sensitive to abrasion pressures, specifically the removal of target species and O. fusiformis and A. filiformis in deep circalittoral sand or muddy sand to the removal of non-target species. However, this is predominantly a result of dredging activity and is therefore not relevant to this gear type.

The information and research within the traps Impacts Evidence documents⁷ suggests that static gears have a relatively low impact on benthic communities (Roberts et al., 2010) and traps are unlikely to be a concern to the designated sediment features of the site at the activity levels described.

Therefore, MMO conclude 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 Western Channel MPA.

4.4 Part B conclusion

The assessment of anchored nets and lines, bottom towed gear and traps on subtidal coarse sediment and subtidal sand features of Western Channel MPA has concluded that the ongoing use of bottom towed gear may result in a significant risk of hindering the achievement of the conservation objectives of the MPA. Management measures will therefore be implemented for bottom towed gear for Western Channel MPA. **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, with 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.

There may be operational submarine cables within this MPA, these cables are already in-situ and are unlikely to have any residual abrasion/ removal pressure incombination 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 Western Channel MPA that interact with the seabed. Incombination effects of these fishing activities as well as these activities incombination 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 Western Channel 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 7**)

Table 7 summarises the pressures exerted by fishing 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 activity with no proposed or current fisheries management in place are considered.

Table 6: Pressures exerted by fishing and non-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 pressure sections

5.2 Fishing vs Fishing in-combination pressures

Fisheries vs fisheries in-combination pressures will be considered in this section.

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.

As **section 4.2** describes the annual average VMS records for over 12 m vessels totalled 3,607 counts (2,303 for anchored nets and lines, and 1,304 for traps). VMS records show that over 12 m vessels landed an annual average of 300.06 t (238.87 t using anchored nets and lines, and 61.19 t using traps). For under 12 m vessels, between 2016 and 2021, the estimated annual average fishing effort from the MPA using traps and anchored nets and lines was 9 days (6 days for traps, 3 days for anchored nets and lines, Annex 1, calculated from **Table A1.8**). The estimated total fishing effort (under 12 vessels) derived from the MPA was 47 days (30 days for traps, 17 days for anchored nets and lines. Between 2016 and 2020, annual average landings for under 12 m vessels were 10.22 tonnes, 5.77 tonnes for traps and 4.45 tonnes for anchored nets and lines.

Given the level of fishing activity for both anchored nets and lines, and traps in this site, there is the possibility that 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. In view of this, a spatial overlap check was undertaken. This spatial overlap check demonstrated gear separation between anchored nets and lines, and traps in some areas of the site with anchored nets and lines mainly focused on the southern part of the site and traps focused on the northern part of the site, however, there was some gear overlap present. Where there is the greatest amount of gear overlap, there is a mosaic habitat of subtidal coarse sediment and subtidal sand. As discussed in section 4.3 the features subtidal coarse sediment and subtidal sand are of low sensitivity to impacts from static fishing gears, with two biotopes within the feature subtidal sand which are sensitive to abrasion pressures, and none within subtidal coarse sediment are sensitive to abrasion pressure. Those biotopes which are sensitive to abrasion such as Maldanid polychaetes and Eudorellopsis deformis in deep circalittoral sand or muddy sand are known to be relatively protected from surface disturbance by its burrowing life habitat and is thought to have no sensitivity to surface abrasion from correctly deployed nets, weights and anchors (Ashley, 2016).

Given the scale of footprint for impacts from both these static gear groups, and evidence to suggest the sensitive biotopes found within subtidal coarse sediment and subtidal sand are resilient to pressures from static gear and have no sensitivity to these gears if correctly deployed, MMO does not consider the in-combination effect from these activities as likely to cause a significant risk of hindering the achievement of the conservation objectives. The sensitivities of the subtidal coarse sediment and subtidal sand within the site are described in **Section 4.3**.

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 Western Channel 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 Western Channel 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 Western Channel MPA.

Part B of this assessment concluded that ongoing use of bottom towed gear on the sedimentary features subtidal coarse sediment and subtidal sand of Western Channel MPA may hinder the achievement of the conservation objectives of the MPA as a result of the impacts of abrasion or disturbance, penetration and smothering, siltation rate and suspended solid changes.

Parts B and C of this assessment concluded that the ongoing use of anchored nets and lines and traps, alone or in combination on the features subtidal coarse sediment and subtidal sand does 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 of the MPA, MMO will implement a byelaw to prohibit the use of bottom towed gear throughout Western Channel 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 <u>Stage 3 MPA Site Assessment Methodology</u> document⁴.



Western Channel Marine Protected Area

Management Proposed specified area for the prohibition of bottom-towed gear Organisation



Projection: Lambert Azimuthal Equal Area MMO Reference: 10786 Not to be used for navigation. Contains Collins Bartholomew, DEFRA, JNCC, MMO, Ordnance Survey and UKHO data. © Collins Bartholomew, DEFRA, JNCC, MMO, Ordnance Survey and UKHO copyright and database right 2024. © ICES Statistical Rectangles dataset 2020. ICES, Copenhagen. Contains public sector information licensed under the Open Government Licence v3.0

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.

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Annexes

Annex 1: Fishing activity data

Table A1.1: VMS record count per nation group (UK and EU Member State) 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)		Annual average (201 6 to 2021)	
Gear group	Gear code	Nation group	Count	%	Count	%	Count										
Anchored	GN	UK	68	100	69	100	77	100	104	100	24	100	92	100	434	100	72
Net/Line	GN T	otal	68	3	69	3	77	3	104	5	24	1	92	3	434	3	72
	GNS	EU	1,661	88	1,494	85	1,455	90	765	78	1,123	95	0	0	6,498	86	1,083
	GNS	UK	224	12	257	15	167	10	213	22	56	5	163	100	1,080	14	180
	GNS	Total	1,885	72	1,751	69	1,622	71	978	51	1,179	70	163	6	7,578	55	1,263
	GTN	EU	206	100	286	100	123	100	88	100	10	100	430	100	1,143	100	191
	GTN	Total	206	8	286	11	123	5	88	5	10	1	430	15	1,143	8	191
	GTR	EU	459	100	308	71	393	85	707	94	458	99	2,059	99	4,384	94	731
	GTR	UK	2	0	128	29	68	15	45	6	4	1	31	1	278	6	46
	GTR	Total	461	18	436	17	461	20	752	39	462	28	2,090	75	4,662	34	777
Anchored Total	Net/L	ine	2,620	20	2,542	21	2,283	19	1,922	19	1,675	14	2,775	25	13,817	20	2,303
Demersal	SDN	EU	0	0	0	0	0	0	9	100	44	100	0	0	53	100	9
Seine	SDN [*]	Total	0	0	0	0	0	0	9	100	44	100	0	0	53	60	9
	SSC	EU	0	0	0	0	0	0	0	0	0	0	36	100	36	100	6

		2016		2017		2018		2019		2020		2021		Total (2016 to 2021)		Annual average (201 6 to 2021)	
Gear group	Gear code	Nation group	Count	%	Count	%	Count										
	SSC	Total	0	0	0	0	0	0	0	0	0	0	36	100	36	40	6
Demersal	Seine	Total	0	0	0	0	0	0	9	0%	44	0%	36	0%	89	0%	15
Demersal	ОТВ	EU	9,025	100	8,673	100	8,953	100	5,934	10	9,147	100	6,426	100	48,158	100	8,026
trawl	ОТВ	UK	0	0	0	0	0	0	0	0	0	0	3	0	3	0	1
	ОТВ	Total	9,025	99	8,673	100	8,953	100	5,934	100	9,147	100	6,429	99	48,161	99	8,027
	ΟΤΤ	EU	1	100	1	100	1	100	6	100	1	100	4	100	14	100	2
	OTT	Total	1	0	1	0	1	0	6	0	1	0	4	0	14	0	2
	твв	EU	12	9	5	20	9	28	2	9	0	0	6	75	34	15	6
	TBB	UK	121	91	20	80	23	72	21	91	2	100	2	25	189	85	32
	TBB	Total	133	1	25	0	32	0	23	0	2	0	8	0	223	0	37
	TBN	EU	0	0	0	0	0	0	0	0	0	0	54	100	54	100	9
	TBN	Total	0	0	0	0	0	0	0	0	0	0	54	1	54	0	9
Demersal	trawl	Total	9,159	69	8,699	72	8,986	75	5,963	60	9,150	77	6,495	59	48,452	69	8,075
Dredge	DRB	UK	0	0	0	0	0	0	0	0	0	0	1	100	1	100	0
	DRB	Total	0	0	0	0	0	0	0	0	0	0	1	100	1	100	0
Dredge To	otal		0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
Midwater	LLD	EU	0	0	5	100	15	100	0	0	0	0	0	0	20	100	3
Hook/Line s	LLD .	Total	0	0	5	100	15	100	0	0	0	0	0	0	20	100	3
Midwater Total	Hook/	'Lines	0	0	5	0	15	0	0	0	0	0	0	0	20	0	3
Midwater	ОТМ	EU	6	100	13	100	1	100	2	100	5	100	2	100	29	100	5
Trawl	ОТМ	Total	6	100	13	100	1	100	2	100	5	100	2	100	29	100	5

			201	6	201	7	201	8	201	9	202	0	202	1	Total (to 20	2016 21)	Annual average (201 6 to 2021)
Gear group	Gear code	Nation group	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count
Midwater	Trawl	Total	6	0	13	0	1	0	2	0	5	0	2	0	29	0	5
Traps	FPO	EU	1,531	100	854	100	711	100	2,064	100	1,011	97	985	61	7,156	91	1,193
	FPO	UK	0	0	0	0	0	0	0	0	29	3	639	39	668	9	111
	FPO [·]	Total	1,531	100	854	100	711	100	2,064	100	1,040	100	1,624	100	7,824	100	1,304
Traps Tot	al		1,531	11	854	7	711	6	2,064	21	1,040	9	1,624	15	7,824	11	1,304
Unknown	NK	EU	2	100	0	0	0	0	0	0	0	0	144	100	146	99	24
	NK	Europe an Free Trade Associ ation	0	0	0	0	0	0	1	100	0	0	0	0	1	1	0
	NK T	otal	2	100	0	0	0	0	1	100	0	0	144	100	147	100	25
Unknown	Total		2	0	0	0	0	0	1	0	0	0	144	1	147	0	25
Grand Tot	tal		13,318	18	12,113	17	11,996	17	9,961	14	11,914	18	11,077	17	70,379	17	11,730

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

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
	GN	22.85	33.76	26.81	62.07	6.00	151.49	30.30
Anchored Net/Line	GNS	70.35	55.53	87.57	96.83	23.52	333.80	66.76
	GTR	1.00	17.63	10.20	11.29	1.29	41.40	8.28
Anchored Net/Line Total		94.20	106.93	124.58	170.18	30.81	526.70	105.34
Demersal trawl	TBB	14.34	3.62	2.44	3.82	0.07	24.29	4.86
Demersal trawl Total		14.34	3.62	2.44	3.82	0.07	24.29	4.86
Traps	FPO	0	0	0	0	10.31	10.31	2.06
Traps Total		0	0	0	0	10.31	10.31	2.06
Grand Total		108.54	110.55	127.03	174.00	41.20	561.31	112.26

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

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
	GNS	10.58	1.30	1.31	4.06	4.04	21.29	4.26
Apphared Not/Line	GTN	0	0	0	0.48	0.06	0.54	0.11
Anchored Net/Line	GTR	153.46	103.47	114.33	143.76	130.82	645.83	129.17
	LLS	0	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0				
Anchored Net/Line Total		164.03	104.77	115.63	148.30	134.92	667.66	133.53
Demersal Seine	SDN	0	0	0	1.95	7.50	9.45	1.89
Demersal Seine Total		0.00	0.00	0.00	1.95	7.50	9.45	1.89
Demersal trawl	OTB	836.82	782.74	735.43	539.77	722.20	3,616.96	723.39

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
	OTT	0.07	0.04	0.08	0.05	0.02	0.26	0.05
	TBB	2.62	0.53	2.24	0.56	0.00	5.96	1.19
Demersal trawl Total		839.51	783.31	737.75	540.39	722.21	3,623.18	724.64
Midwater Hook/Lines	LLD	0	5.90	6.10	0	0	12.01	2.40
Midwater Hook/Lines Total		0	5.90	6.10	0	0	12.01	2.40
Midwator Trawl	OTM	48.76	52.72	0.25	0	171.81	273.54	54.71
	PTM	0	0	0	0	0	0	0
Midwater Trawl Total		48.76	52.72	0.25	0	171.81	273.54	54.71
Traps	FPO	83.02	41.96	26.38	95.77	48.54	295.67	59.13
Traps Total		83.02	41.96	26.38	95.77	48.54	295.67	59.13
Grand Total		1,135.33	988.66	886.11	786.41	1,085.00	4,881.51	976.30

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

ICES rectangle	Percentage overlap (%)
27E4	11.45
27E5	18.01
28E5	10.53

Table A1.5: UK live weight landings tonnage (t) estimates by gear from vessels under 12 m in length for the MMO section of Western Channel 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)
	GN	0	2.48	2.74	0.31	0.87	6.41	1.28
Anchored Net/Line	GNS	3.88	3.20	1.32	1.76	0	10.16	2.03
	GTR	0.95	0	0	0	0	0.95	0.19
Anchored Net/Line Total		4.83	5.68	4.06	2.07	0.87	17.52	3.50
	ОТ	0	0.01	0	0	0	0.01	<0.01
Demonsel freud	OTB	0.08	0.11	0.10	0.88	0.07	1.23	0.25
Demersal trawi	OTT	0	0	0	0	0	0	0
	TBB	0	0	0	0	0.27	0.27	otal (2016 to 2020)Average (2016 to 2020)6.411.2810.162.030.950.19 17.523.50 0.01<0.01
Demersal trawl Total		0.08	0.12	0.10	0.88	0.34	1.52	0.30
Dredge	DRB	12.05	2.73	1.63	5.02	0.42	21.85	4.37
Dredge Total		12.05	2.73	1.63	5.02	0.42	21.85	4.37
Midwater Hook/Lines	LHP	0	0	0.02	0	0.02	0.03	0.01
Midwater Hook/Lines Total		0	0	0.02	0	0.02	0.03	0.01
Traps	FPO	6.55	8.92	0	7.47	5.78	28.72	5.74
Traps Total		6.55	8.92	0.00	7.47	5.78	28.72	5.74
Grand Total		23.51	17.45	5.81	15.44	7.43	69.63	13.93

Table A1.6: EU27 live weight landings tonnage (t) estimates by gear from vessels under 12 m in length for the MMOsection of Western Channel 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)
	LLS	0	0	0	<0.01	0.13	0.13	0.03
Anchored Net/Line	GTR	0	0.08	0.02	0.40	0.19	0.69	0.14
	GNS	1.13	0.97	0.79	0.91	0.10	3.90	0.78
	GTN	0	0.01	0	0	0	0.01	<0.01
Anchored Net/Line Total		1.13	1.06	0.81	1.31	0.42	4.74	0.95
Demersal Seine	SSC	0	0	0	0	0.15	0.15	0.03
Demersal Seine Total		0	0	0	0	0.15	0.15	0.03
Demonsel freud	OTB	0	0.04	0.01	0	0.01	0.06	0.01
Demersal trawi	OTT	0	0	0	0.01	0.03	0.04	0.01
Demersal trawl Total		0	0.04	0.01	0.01	0.04	0.10	0.02
Drodge	DRB	<0.01	0.06	0	0.15	0.31	0.52	0.10
Dredge	HMD	0	0	0	1.94	0	(2016 to 2020) 0.13 0.69 3.90 0.01 4.74 0.15 0.15 0.06 0.04 0.04 0.04 0.04 0.52 1.94 2.46 0 0 0.52 1.94 2.46 0 0 0.07 0.07 0.11 0.11 0.18 0.17 0.17 7.81	0.39
Dredge Total		<0.01	0.06	0	2.10	0.31	2.46	0.49
Midwater - Gill Encircling	GNC	0	0	0	<0.01	0	0	<0.01
Midwater - Gill Encircling Total		0	0	0	<0.01	0	0	<0.01
Midwatar Hook/Linco	LHP	0.07	0.00	<0.01	0	<0.01	0.07	0.01
Midwater Hook/Lines	LTL	0	0	0	0	0.11	0.11	0.02
Midwater Hook/Lines Total		0.07	0.00	<0.01	0	0.11	0.18	0.04
Traps	FPO	<0.01	<0.01	0	0.03	0.13	0.17	0.03
Traps Total		<0.01	<0.01	0	0.03	0.13	0.17	0.03
Grand Total		1.21	1.16	0.83	3.45	1.16	7.81	1.56

Table A1.7: Mean annual surface and subsurface SAR values for C-squares intersecting the MMO section of WesternChannel MPA (2016 to 2020).

Gear group	SAR category	2016	2017	2018	2019	2020
Domoroal Sainaa	Surface	0	<0.01	<0.01	0.02	0.03
Demersal Seines	Subsurface	0	0	0	0	<0.01
Dradaaa	Surface	<0.01	<0.01	0	<0.01	0
Dredges	Subsurface	<0.01	<0.01	0	<0.01	0
Domoroal Trowla	Surface	4.66	4.28	4.43	3.26	4.88
	Subsurface	0.40	0.37	0.39	0.27	0.39
Bottom Towad Coor	Surface	4.66	4.28	4.43	3.28	4.91
Bollom Towed Gear	Subsurface	0.40	0.37	0.39	0.27	0.39

Table A1.8: Fishing effort (days) recorded by UK vessels under 12 m in length, separated by gear type for the area of Western Channel MPA that intersects the marine portion of ICES rectangles 27E4, 27E5 and 28E5 (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).

	Fishing effort (days at sea)										
Gear group	2016	2017	2018	2019	2020	2021	Total (2016 to 2021)	Annual average (2016 to 2021)			
Bottom towed gear total	16.62	3.97	2.99	8.10	1.84	6.20	39.72	6.62			
Midwater hooks and lines	0	0	0.11	0	0.54	19.90	20.55	3.42			
Midwater gear total	0	0	0.11	0	0.54	19.90	20.55	3.42			
Traps	6.21	8.95	0	6.79	6.21	6.03	34.20	5.70			
Anchored nets and lines	3.63	5.02	3.74	2.07	1.74	4.27	20.46	3.41			
Static gear total	9.84	13.98	3.74	8.86	7.95	10.30	54.67	9.11			
MPA total	26.46	17.95	6.84	16.96	10.34	36.40	114.93	19.16			