Marine Management Organisation

MMO Stage 3 Site Assessment: Fylde MPA (DRAFT)

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Title: MMO Stage 3 Site Assessment: Fylde MPA (DRAFT)
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Executive Summary

This assessment analyses the impact of anchored nets and lines, bottom towed gear and traps on the designated features subtidal mud and subtidal sand in Fylde 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 fishing activities by bottom towed gear occurring in the site pose a significant risk of hindering the achievement of the conservation objectives of Fylde MPA. As such 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 Fylde 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.

Although MMO is responsible only for the area of the MPA beyond 6 nautical miles (nm), in the interest of continuity and compliance, it has been agreed with North Western Inshore Fisheries and Conservation Authority (IFCA) that MMO will assess Fylde MPA as a whole and not just the section beyond 6nm.

2 Site information

2.1 Overview

The following Natural England conservation advice package 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 in this assessment:

- Natural England Conservation Advice - Fylde MCZ[1]; and
- Defra Factsheet - Fylde MCZ[2].

Fylde MPA is located in Liverpool Bay and lies between 3 and 20 kilometres (km) off the coast of Fylde and the Ribble Estuary. The depth of the seabed ranges from 35 centimetres (cm) at low tide to 22 metres (m) at its deepest. The site straddles the 6 nautical mile (nm) limit and covers an area of approximately 260 square kilometres (km^2), with the MMO remit covering an area of approximately 74 km^2 (**Figure 1**). Fishing in the site is regulated by the North Western Inshore Fisheries and Conservation Authority (IFCA) (0 to 6 nm) and the MMO (beyond 6 nm).

[1] Natural England Conservation Advice – Fylde MCZ. designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0007 (Last accessed 27 August 2023)

[2] Defra Factsheet – Fylde MCZ. www.gov.uk/government/publications/marine-conservation-zone-2013-designation-fylde (Last accessed 10 May 2023)

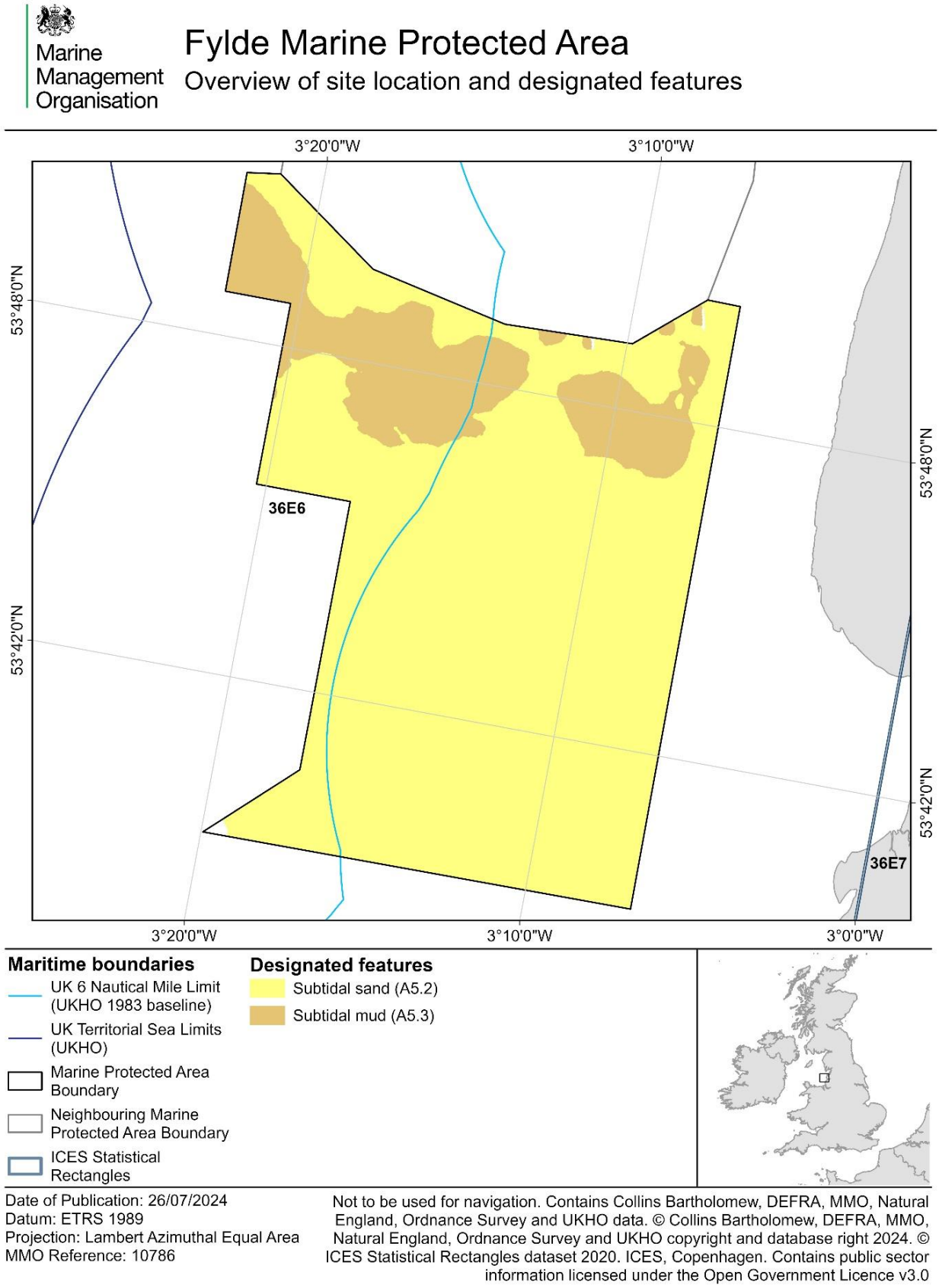

Figure 1. Fylde MPA location overview.

Fylde MPA was designated as a MCZ in 2013. The site is designated to protect the feature 'subtidal sand' and was updated in 2016 to include 'subtidal mud' as a protected feature. The sediment features of this site are considered to be good representatives of the seabed communities and habitats present on the eastern side of Liverpool Bay. The area supports a diverse community of crabs, starfish and shrimp-like crustaceans and a rich mixed polychaete and bivalve mollusc population, including the white furrow shell (*Abra alba*), razor shell (*Pharus legume*), and the small nut-shell (*Nucula nitidosa*). The site is also home to important nursery and spawning grounds for many commercially important fish species including plaice (*Pleuronectes platessa*), sole (*Solea solea*) and whiting (*Merlangius merlangus*). Subtidal sand occurs throughout the site but is dominant in the southern half. The presence of subtidal mud increases further north of the site, dominating the northern quarter. The middle of the site is therefore made up of muddy sands, which are classed as 'subtidal sand' in MCZ classification. A small sandbank has been identified within the site, approximately 9 km in length and 2 km wide, running in a south-east to the north-west direction across the site.

The designated features and their general management approaches are set out in

Table 1.

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

Designated feature	General management approach
Subtidal sand	Maintain in favourable condition
Subtidal mud	

There is no feature condition assessment available for this site; in its absence, the feature's condition has been based on a vulnerability assessment, which includes sensitivity and exposure information for the features and activities as a proxy for condition. This was completed as part of the initial assessment of recommended MPAs (Joint Nature Conservation Committee (JNCC) and Natural England, 2012), which proposed a general management approach of 'Maintain' for the sediment features.

Some site level biotope information is available for site. Natural England's supplementary advice on conservation objectives - Fylde MCZ[3] highlights the presence of biotopes '*Amphiura filiformis, Mysella bidentata* and *Abra nitida* in circalittoral sandy mud' (De-Bastos and Hill, 2016) at the western edge of the site, and '*Abra alba* and *Nucula nitidosa* in circalittoral muddy sand' (Tillin and Budd, 2023) common across central and northern parts of the site. In addition, the 2015

[3] Natural England Supplementary Advice on Conservation Objectives – Fylde MCZ. designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UKMCZ0007 (Last accessed 11 May 2023)

Fylde MCZ baseline grab survey confirms the presence of additional biotopes in the site, including '*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand' (De-Bastos *et al.*, 2023) and '*Lagis koreni* and *Phaxas pellucidus* in circalittoral sandy mud' (Miller and Green, 2017).

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 2009[4].

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.

[4] For more information: Marine and Coastal Access Act 2009 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 Site Assessment Methodology document[5], 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 Fylde MPA.

Gear type	Gear name	Gear code	Justification
Anchored nets and lines	Gill nets (not specified)	GN	Present in UK under 12 m landings data for ICES statistical rectangles that overlap the site.
	Gillnets and entangling nets	GEN	
	Longline (unspecified)	LL	
	Set gillnet (anchored)	GNS	
	Trammel net	GTR	
Bottom towed gear	Beam trawl	TBB	
	Bottom otter trawl	OTB	Present in VMS records and UK under 12 m landings data for ICES statistical rectangles that overlap the site.
	Hand mechanised dredge	HMD	Present in VMS data.

[5] MPA Site Assessment Methodology document. www.gov.uk/government/publications/stage-3-site-assessments (Last accessed: 05 August 2024)

Gear type	Gear name	Gear code	Justification
Bottom towed gear	Nephrops trawl	TBN	Present in VMS records and UK under 12 m landings data for ICES statistical rectangles that overlap the site.
	Otter trawls (unspecified)	OT	Present in UK under 12 m landings data for ICES statistical rectangles that overlap the site.
	Towed dredge	DRB	Present in VMS records and present in UK and non-UK under 12 m landings data for ICES statistical rectangles that overlap the site.
	Twin bottom otter trawl	OTT	Present in the UK under 12 m landings data for ICES statistical rectangles that overlap the site.
Midwater gear	Drift gillnet	GND	
	Hand-operated pole-and-line	LHP	
	Hook and line (unspecified)	LX	
Misc	Miscellaneous	MHX, MIS	
Traps	Pot/Creel	FPO	Present in VMS records and present in UK and non-UK under 12 m landings data for ICES statistical rectangles that overlap the site.

3.2 Pressures and activities screened out

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

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

- **Midwater gears:** although the use of midwater gears does occur within Fylde MPA, there is no feasible pathway for gears of this type to interact with benthic designated features not considering gear failure or net loss. These gears are not designed to operate on or near the seabed and are deployed entirely within the water column. Therefore, the use of midwater gear within Fylde MPA is not considered to be capable of affecting the designated features other than insignificantly and is not considered further within this assessment.
- **Shore based activities:** although landings data shows that fishing activity using hand mechanised dredge occurs within the site, this is based on all activity occurring within the ICES rectangle 36E6 overlapping the site. The ICES rectangle encompasses the entirety of Fylde MPA, but also covers a large area of coast where shore based activities occur. As the area of the site

being assessed lies beyond the 6 nm limit, it is not possible that shore-based activities would be capable of affecting the designated features due to distance; shore based activities are therefore not considered further within this assessment.

- **Unknown gear**: 'other gear' has been declared as having been used to land fish from this ICES statistical rectangle. The gear code used to report these landings does not provide any further information relating to the fishing method used. It is therefore not possible to assess the likelihood of this fishing method interacting with the seabed and it is not considered further within this assessment.

3.3 Pressures to be taken forward to Part B

The Stage 3 Fishing Gear MPA Impacts Evidence documents detail all pressures created by fishing activity on features of interest. The documents justify which pressures should be taken forward for consideration for each feature. This is documented in Table A1.2 in each of the Impacts Evidence documents[6].

- Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines[7];
- Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear[8]; and
- Stage 3 Fishing Gear MPA Impacts Evidence Traps[9].

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 Natural England 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.

[6] Stage 3 MPA Impacts Evidence: www.gov.uk/government/publications/marine-protected-areas-stage-3-impacts-evidence (Last accessed 05 August 2024)
[7] Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines: www.gov.uk/government/publications/marine-protected-areas-stage-3-impacts-evidence (Last accessed 05 August 2024).
[8] Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear: www.gov.uk/government/publications/marine-protected-areas-stage-3-impacts-evidence (Last accessed 05 August 2024).
[9] Stage 3 Fishing Gear MPA Impacts Evidence Traps: www.gov.uk/government/publications/marine-protected-areas-stage-3-impacts-evidence (Last accessed 05 August 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 Fylde MPA to be taken forward to Part B.

Potential pressures	Designated feature					
	Subtidal mud			Subtidal sand		
	A	B	T	A	B	T
Abrasion or disturbance of the substrate on the surface of the seabed						
Changes in suspended solids (water clarity)						
Deoxygenation						
Hydrocarbon and polycyclic aromatic hydrocarbon (PAH) contamination						
Introduction of light						
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)						
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 required by section 126 of the Marine and Coastal Access Act 2009[4].

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 Fylde conservation advice package and are shown in **Table 4**.

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

Attribute	Target	Relevant Pressures
Distribution: presence and spatial distribution of biological communities.	Maintain	• 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. • Changes in suspended solids (water clarity).
Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore]	
Structure: sediment composition and distribution	Maintain	
Structure: species composition of component communities	Maintain	
Supporting processes: water quality - turbidity (habitat)	Maintain	

4.1 Fisheries access and existing management

As Fylde MPA lies within the 12 nm limit, only UK vessels have access to fish in the site.

More information on non-UK vessel access to UK waters can be found on MMO's Single Issuing Authority page[10].

No MPA management measures for fishing are currently in place for MMO's portion of Fylde MPA (offshore of 6 nm). The Kingfisher fishing restriction map (Seafish, 2023) contains information on MPA management measures for the portion of the site inside of 6 nm.

4.2 Fishing activity summary

Table A1.1 to **Table A1.7** in **Annex 1: Fishing activity data** display a detailed breakdown of fishing activity within Fylde MPA.

Traps were the most prevalent type of fishing activity in the site, consisting specifically of pots and creels. Between 2016 and 2021 there were a total of 188 UK over 12 m VMS records for traps in the site, with an annual average of 31 records. From 2016 to 2020, the numbers remain consistent, with a peak in 2019 (73 records), with a decline to 9 VMS records in 2021. UK over 12 m vessels landed an average of 10.57 tonnes per year using traps, with a large increase in landings from 3.85 tonnes in 2017 to 13.88 in 2018. UK under 12 m vessels using traps landed 1.01 tonnes in the same period, accounting for approximately 56 % of the records, with a rapid increase in landings from 0.01 tonnes in 2016 to 2.37 tonnes in 2017. The only landings from EU under 12 m vessels using traps were in 2019 (0.03 tonnes). However, as there is no non-UK access to Fylde MPA, these records can be discounted as fishing activity is unlikely to be occurring in the site. Fishing activity from traps for UK under 12 m vessels accounted for approximately 15 days between 2016 and 2020 (22.8 % of the total fishing effort), the third most common gear type after anchored nets and lines and demersal trawls. In general, fishing activity from traps increases from 2016 to peaks in 2019, with a decline in 2020.

There is minimal activity from bottom towed gear (demersal trawls and dredges), specifically bottom otter trawls and towed dredges, reported in Fylde MPA. There are 3 VMS records linked to bottom towed gear types within the site from 2016 to 2021, with an annual average of less than one record over six years. One record was from dredges in 2017, one from demersal trawls in 2018 and again in 2019. Landings data for UK over 12 m length vessels show that the annual average for both trawls and dredges were less than a tonne per year. For UK under 12 m vessels, landings

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

records are less than half a tonne on average for both trawls and dredges. Landings data for EU under 12 m vessels using dredges only occur in 2019 (0.02 tonnes). However, as there is no non-UK access to Fylde MPA, these records can be discounted as fishing activity is unlikely to be occurring in the site. Surface SAR values for C-squares intersecting Fylde MPA range between 0 and 0.03 for trawls, and 0 and 0.003 for dredges, while subsurface SAR values range between 0 and 0.004 for trawls, and 0 and 0.001 for dredges. A SAR value of 1 means that each area C-square experiences a pass of fishing gear on average once a year. Therefore, a value of 0.004 means that at this current level of activity it would take over 200 years for the whole site to be swept once.

Fishing activity from anchored nets and lines only appears in the UK under 12 m length landings and fishing effort data. Landings data for UK under 12 m vessels show that an average of 0.3 tonnes per year was recorded between 2016 and 2020. Fishing intensity increased from 2016 to 2017 to a peak of 0.59 tonnes, declining in 2018 to 0.22 tonnes and gradually decreasing through to 2020 (0.16 tonnes). In addition, fishing effort suggests that anchored nets and lines are the most frequently used gear type within the site for UK under 12 m vessels with 28.75 days between 2016 and 2020 (43.7 % of the total fishing effort). Fishing effort days has been apportioned based on percentage overlap of the ICES rectangle and the MPA. As the site only occupies 2.1 % of the overlapping ICES rectangle, it is unlikely that any significant activity from anchored nets and lines is occurring in Fylde MPA.

The sections below explore the pressures that each gear type exert on Fylde MPA's designated features in light of the activity levels described.

4.3 Pressures by gear type

The Stage 3 Fishing Gear MPA Impacts Evidence documents for anchored nets and lines[7], bottom towed gear[8] and traps[9] 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 approach, intensity of fishing activity taking place and exposure to natural disturbance.

While subtidal mud is considered to be more sensitive to some of the pressures identified for different gear types than subtidal sand by the Impacts Evidence documents[7],[8],[9], these features have been considered together for static gear due to the levels of fishing activity occurring in the site. 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

and influential species). This may occur through intentional or unintentional catch associated with the act of commercial fishing.

Impacts from target and/or 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 Natural England. Where separate consideration of these pressures is required, this has been stated.

There is limited survey information available for this site so available information on biotopes of the features present in the site have been identified using MMO designated features WebApp[11]. Sensitivity information was extracted from Marlin[12].

Using this information biotopes were screened out if they were not sensitive or had low sensitivity to the relevant pressures in **Table 4.**

The resulting screened in biotopes are listed in **Table 5**.

[11] MMO designated feature WebApp. defra.maps.arcgis.com/apps/dashboards/6e5322b6cb664066a2a667ed964b694a - (Last accessed 06 August 2024)

[12] Sensitivity information from Marlin. www.marlin.ac.uk/habitats/eunis Accessed 23/06/2023 - (Last accessed 23 June 2023)

Table 5: Biotopes to be considered.

Feature	Biotope	Sensitivity
Subtidal sand	*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand (De-Bastos *et al.*, 2023)	Abrasion and penetration; medium
	Amphiura brachiata with *Astropecten irregularis* and other echinoderms in circalittoral muddy sand (De-Bastos, Lloyd and Watson, 2023)	
Subtidal mud	*Amphiura filiformis*, *Mysella bidentata* and *Abra nitida* in circalittoral sandy mud (De-Bastos and Hill, 2016)	Abrasion; medium
	Thyasira spp. and *Nuculoma tenuis* in circalittoral sandy mud (De-Bastos and Watson, 2023b)	
	Amphiura filiformis and *Nuculoma tenuis* in circalittoral and offshore muddy sand (De-Bastos and Watson, 2023a)	
	Virgularia mirabilis and *Ophiura* spp. with *Pecten maximus* on circalittoral sandy or shelly mud (Hill *et al.*, 2024)	Abrasion; high Penetration; medium

4.3.1 Anchored nets and lines

The relevant pressures on subtidal sediment features of Fylde 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; and
- removal of non-target species; and
- removal of target species.

As noted above, impacts from target and non-target removal pressures have been scoped out from this assessment, as they are assessed more completely within the abrasion and penetration pressures.

The impacts of abrasion or disturbance of the seabed on sediment features are most likely to occur during the hauling of gear and from movement of the gear along the seabed as a result of strong tides, currents, and storms. However, according to

section 9.4 of the Anchored nets and lines Impacts Evidence document[7] assuming correct deployment of the gears, abrasion pressures from the use of anchored nets and lines are unlikely to hinder the conservation objectives of subtidal mud and subtidal sand habitats in this site.

The impact from abrasion pressures on subtidal mud and sand features from anchored nets and lines are likely to be greatest on the epifauna present. For subtidal mud, evidence for the impacts from this pressure are described in section 9.5 of the Anchored nets and lines Impacts Evidence documen[7] are in relation to sensitive erect epifauna such as seapen. However, according to the Natural England conservation advice package[1], there are no known records of sensitive erect species in Fylde MPA at the current time.

As detailed in **Table 1Table 5**, six biotopes were identified with medium sensitivity to relevant pressures, or higher. Two biotopes in subtidal sand were medium sensitivity to abrasion and penetration. Three biotopes in subtidal mud were medium sensitivity to abrasion. One other biotope, '*Virgularia mirabilis* and *Ophiura* spp. with *Pecten maximus* on circalittoral sandy or shelly mud' was not only medium sensitivity to penetration, but high sensitivity to abrasion. The biotope '*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand' in subtidal sand of the MPA, has medium sensitivity to abrasion, as these species are likely to be damaged by an abrasive force such as the pass of fishing gears (De-Bastos and Hill, 2016b). This is largely discussed in relation to the impacts of trawling, however scour by objects such as anchored nets and lines on the seabed can also have an impact on the surface of sediments (De-Bastos and Hill, 2016b).

The biotope '*Amphiura filiformis*, *Mysella bidentata* and *Abra nitida* in circalittoral sandy mud' in subtidal mud of the MPA, has medium sensitivity to abrasion. The species present require contact with the surface of the seabed for respiration and feeding, and important structures can be damaged or withdrawn in response to disturbance from fishing gear (De-Bastos and Hill, 2016a; De-Bastos, 2023). However, the evidence for medium sensitivity is largely driven by the impact of trawling (De-Bastos and Hill, 2016a; De-Bastos, 2023).

For this subtidal mud biotope, significant impacts in population density are likely to occur if disturbance is repeated at regular intervals (De-Bastos and Hill, 2016a; De-Bastos, 2023). However, the Anchored nets and lines Impacts Evidence document[7] also considers subtidal sediments to be resilient to all but intense levels of fishing from static gears in sediments with stable species richness or sands with long-lived bivalves. Also, as per **section 4.2**, fishing activity from anchored nets and lines in general declines after a peak in 2017 where it then remains at low intensity according to the UK under 12 m length vessel landings data. In addition, there are no VMS records for anchored nets and lines in the site, therefore there is no evidence that there is spatial overlap between the biotopes and fishing activity from anchored

nets and lines. Overall, there is currently little interaction occurring between these gears and the designated features, so the risk of abrasion and disturbance is limited.

Therefore, **MMO concludes that the ongoing use of anchored nets and lines 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 subtidal sediment features of Fylde MPA from bottom towed gear were identified in **Table 3** and are:

- abrasion and disturbance of the substrate on the surface of the seabed$^{\Delta}$;
- penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion$^{\Delta}$;
- removal of non-target species;
- removal of target species (for dredges only, and only subtidal sand not mud);
- changes in suspended solids (water clarity)*; and
- smothering and siltation rate changes*.

As noted above, impacts from target and non-target removal pressures have been scoped out from this assessment, as they are assessed more completely within the abrasion and penetration pressures. Pressures marked with matching superscript symbols (Δ and *) have been consolidated due to the similar nature of their impacts on the sediment features.

Fishing activity in **section 4.2** shows that the use of bottom towed gear within Fylde MPA is limited, with a total of 3 VMS records from 2016 to 2021 for both dredges and demersal trawls.

‘Changes in suspended solids (water clarity)’ and ‘Smothering and siltation rate changes (light)’

Changes in suspended solids, smothering and siltation rate pressures can cause disturbance to the upper layers of sediments when they come into contact with bottom towed gear, causing sediments to become re-suspended. As per the Bottom Towed Gear Impacts Evidence document[8], these impacts vary depending on the species present within the habitats, as suspended particles can affect the ability of suspension feeders and/or deposit feeding bivalves to breathe and feed. However, these impacts are only likely to be significant if there is a chronic and sustained change in water turbidity from background levels. In addition, all the biotopes for both subtidal sand and subtidal mud in this bioregion have either low sensitivity or are not sensitive to these pressures.

‘Abrasion or disturbance of the substrate on the surface of the seabed’ and ‘Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion’.

The Bottom Towed Gear Impacts Evidence document[8] states that abrasion and penetration pressures from bottom towed gear can result in both physical and biological impacts on subtidal sediment features that vary based on the gear type, sediment type, and degree of natural disturbance. Abrasion from dredges can result in direct mortality of species on the seabed, whereas abrasion from demersal trawls can reduce the habitat complexity and can permanently alter the biological community and state of the habitat. The first pass of bottom towed gear does the most damage to the species and communities in subtidal sediments, removing the most sensitive species resulting in a shift in the biological community. This leaves a community dominated by opportunistic, short-lived species that may be more resilient to trawling than those removed at the first pass. While activity data in **section 4.2** suggest that there are very low levels of fishing activity from bottom towed gear in the site, the Natural England conservation advice package[1] suggests that there are biotopes present that have medium sensitivity to these pressures. Therefore, abrasion and penetration pressures from bottom towed gear could hinder the conservation objectives of the site depending on the sensitivities of the biotopes present, despite currently low levels of bottom towed gear activity.

According to section 8.5 of the Bottom towed gear Impacts Evidence document[8], subtidal sand is likely to be more resilient and recovers quicker than subtidal mud due to the high levels of natural disturbance that occur in offshore areas where subtidal sand is typically found. As the sand gets muddier further north of Fylde MPA, the recovery time from disturbance increases. Muddy sands have the slowest rate of community restoration, and tracks from demersal trawls become more noticeable in muddier sands. However, these tracks are likely to disappear due to the natural disturbance from waves and tides. As detailed in **Table 5**, the biotope '*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand' has medium sensitivity to abrasion in response to bottom towed gear. This is because these species are likely to be damaged by an abrasive force, such as the pass of fishing gears (De-Bastos and Hill, 2016b). These species are vulnerable to trawling, and large reductions in the numbers of both species groups and high levels of damage have been observed in response to fishing activity from bottom towed gear (De-Bastos and Hill, 2016b). It has also been reported that *Echinocardium cordatum* experience a mortality of up to 40 % due to fishing gear after a single trawling event (De-Bastos and Hill, 2016b). As per **section 4.2**, the surface SAR data suggest that bottom towed gear passage over the seabed ranges from 0 to 0.03 between 2016 and 2020, meaning that at the highest level of activity it would take approximately 33 years for the whole site to be swept once. However, the MMO VMS bottom towed gear WwebmAapp[13] and MMO designated features

[13] MMO bottom towed gear WebApp, 'Stage 3 VMS Report Density - Bottom Towed Gear (2016 to 2021)' defra.maps.arcgis.com/apps/dashboards/7c42fd0f339d4af9be3b484e559750af (Last accessed 06 August 2024)

WebApp[11] suggest that there is unlikely to be a spatial overlap of fishing activity with the '*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand' biotope.

Subtidal mud has small scale topographic features which flatten out as a result of abrasion. As per section 8.5 of the Bottom towed gear Impacts Evidence document[8], this results in a flattened seafloor with high relief features created by furrows from the penetration of otter boards in the gears. Consistent disturbance by passes of gear can lead to permanent changes in biogeochemistry in muds, which results in reduced biomass, diversity and species richness in the habitat. However, given the location of Fylde MPA, the biological communities that inhabit the subtidal sediments are likely to be adapted to some level of natural disturbance and variation in water quality. As detailed in **Table 5**, the subtidal mud biotope present in the MPA '*Amphiura filiformis*, *Mysella bidentata* and *Abra nitida* in circalittoral sandy mud' in circalittoral sandy mud' has medium sensitivity to abrasion. The species present require contact with the surface of the seabed for respiration and feeding, and important structures can be damaged or withdrawn in response to disturbance from fishing gear (De-Bastos and Hill, 2016a; De-Bastos, 2023). The sensitivity of these biotopes is measured in relation to trawling.

These fishing gears are likely to remove or damage a proportion of the populations and penetrate the surface of the mud causing further damage to the burrowing species in the '*Amphiura filiformis*, *Mysella bidentata* and *Abra nitida* in circalittoral sandy mud' biotope (De-Bastos and Hill, 2016a; De-Bastos, 2023). However, this is in relation to repeated regular intervals of disturbance. The MMO bottom towed gear WebAap[13] and MMO designated feature WebApp[11] suggest that there could be a potential spatial overlap of fishing activity with this biotope. However, as per **section 4.2**, there are a total of three VMS records for bottom towed gear between 2016 and 2021, so it is unlikely that a significant interaction is currently occurring between this biotope and bottom towed fishing gears.

Given the low levels of bottom towed gear activity in the years analysed, the use of bottom towed gears at the levels observed will not result in a significant risk of hindering the achievement of the conservation objectives.

However, fishing activity patterns may change due to a wider range of drivers, including changes in target species and/or changes in the spatial distribution of target species, or the discovery of novel stocks, in response to climate change and fisheries displacement, and competition with other activities and conservation measures for space. The first pass of a demersal trawl has proportionately more impact than subsequent passes (Hiddink *et al.*, 2006) so even relatively small increases in bottom towed gear fishing may be of concern, particularly with biotopes present that have a medium sensitivity to pressures created by bottom towed gear, as listed in **Table 5**. The potential for increases in the levels of bottom towed fishing, and resulting abrasion, penetration, suspended solids and smothering and siltation

pressures, and presence of more sensitive biotopes, means that a significant risk of hindering the achievement of the conservation objectives cannot be excluded.

Considering the above, **MMO concludes that at the activity levels described, the use of bottom towed gear does not pose a significant risk of hindering the achievement of the conservation objectives of Fylde MPA. However, the potential for changes in bottom towed gear fishing levels, in combination with the presence of sensitive biotopes in the designated subtidal sand and subtidal mud features means that ongoing fishing using bottom towed gears may result in a significant risk of hindering the achievement of the conservation objectives of the MPA.**

4.3.3 Traps

The relevant pressures on subtidal sediment features of Fylde 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 above, impacts from target and non-target removal pressures have been scoped out from this assessment, as they are assessed more completely within the abrasion and penetration pressures.

Section 4.2 describes the fishing activity within Fylde MPA and shows that potting is the most common gear type used in the site, estimating that an annual average of approximately 10.57 tonnes were landed by UK over 12 m vessels from the site using traps, while a combined annual average of 1.02 tonnes were landed by UK and EU under 12 m vessels.

The impact of abrasion and disturbance pressures from traps and their associated anchors and lines is most likely to occur from the interaction between the gear and the seabed during hauling, or as a result of strong tides, currents and storms.

According to section 9.4 the Traps Impacts Evidence document[9], primary evidence suggests that there are physical impacts of traps on subtidal sediments from the snagging of gear or entanglement and damage to sensitive epifauna. For subtidal mud, the impacts from this pressure are described in the Traps Impacts Evidence document[9] are in relation to sensitive erect epifauna such as seapens. However, according to the Natural England conservation advice package[1], there are no known records of sensitive erect species in Fylde MPA at the current time. In addition, evidence from the Traps Impacts Evidence document[9] states that stable epifauna in both subtidal mud and subtidal sand sediment habitats are likely to have low sensitivity to all but intense levels of potting.

As detailed in **Table 5,** the subtidal sand biotope present or possible in the MPA, '*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand' has medium sensitivity to abrasion, as these species are likely to be damaged by an abrasive force such as the pass of fishing gears (De-Bastos and Hill, 2016b). This is largely discussed in relation to the impacts of trawling, however scour by objects such as traps on the seabed can also have an impact on the surface of sediments (De-Bastos and Hill, 2016b). In addition, the MMO Traps VMS WebAap[14] and MMO designated feature WebApp[11] suggest that there could be potential spatial overlap of fishing activity with this biotope.

As seen in **Table 5** the subtidal mud biotopes present or possible in the MPA '*Amphiura filiformis*, *Mysella bidentata* and *Abra nitida* in circalittoral sandy mud' has medium sensitivity to abrasion. For this biotope, the species present require contact with the surface of the seabed for respiration and feeding, and important structures can be damaged or withdrawn in response to disturbance from fishing gear (De-Bastos and Hill, 2016a; De-Bastos, 2023). However, the evidence for medium sensitivity is largely driven by the impact of trawling (De-Bastos and Hill, 2016; De-Bastos, 2023).

For this subtidal mud biotope, significant impacts in population density are likely to occur if disturbance is repeated at regular intervals (De-Bastos and Hill, 2016a; De-Bastos, 2023). While the MMO Traps VMS WebAap[14] and MMO designated features WebApp[11] suggest that there could be potential spatial overlap of fishing activity with the '*Amphiura filiformis*, *Mysella bidentata* and *Abra nitida* in circalittoral sandy mud' biotope, the Traps Impacts Evidence document[9] considers subtidal sediments to be resilient to all but intense levels of fishing from static gears in sediments with stable species richness or sands with long-lived bivalves. As shown in **section 4.2**, fishing activity from UK over 12 m vessels using traps in Fylde MPA increased from 2017 to 2019, while activity from UK under 12 m vessels rapidly increased from 2016 to 2017. Even though there are increased levels of potting in the MPA in 2019, there is currently little interaction occurring between the gears and the designated features, so the risk of abrasion and disturbance is limited.

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

4.4 Part B conclusion

The assessment of anchored nets and lines, and traps on subtidal sand and subtidal mud in Fylde MPA has concluded that these fishing activities will not result in a

[14] MMO WebApp, 'Stage 3 VMS Report Density - Static Gear (2016 to 2021)'. defra.maps.arcgis.com/apps/dashboards/e6e92d9301f74da4b8300cf64bd67593 (Last accessed 06 August 2024)

significant risk of hindering the achievement of the conservation objectives. As such MMO concludes that management measures to restrict fishing activities at the levels described using anchored nets and lines, and traps are not required in Fylde MPA.

The assessment of bottom towed gear on the designated features in Fylde MPA has concluded that activities may result in a significant risk of hindering the achievement of the conservation objectives of the MPA on the subtidal sand and subtidal mud 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 the 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 have an adverse effect on the site integrity; 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 source receptor pathways that could impact the site in-combination with effects of the fishing activities assessed.

A 5 km buffer was therefore applied to the site boundary to identify relevant activities. This assessment considers the in-combination impacts of marine licensable activities that are ongoing or upcoming, and with 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 adverse effect on site integrity 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 were identified in Part B as requiring management to avoid adverse effects to site integrity. Anchored nets and lines, and traps, are the only remaining fishing activities occurring within Fylde MPA that interact with the seabed. In-combination effects of these fishing activities as well as these activities in-combination with other relevant activities will be assessed in this section.

In accordance with the methodology detailed above, ArcGIS identified five licences within the 5 km buffer applied.

Table 6 shows the activities and their relevant categories from the JNCC Pressures-Activities Database (PAD)[15].

Table 6: summary of marine licensable activities and associated PAD categories.

Marine licence case reference number[16]	PAD Category	Justification
L/2014/00129/1	Navigation markers/lights	United Utilities navigation marker framework, ends 31/12/2024. Works are occurring on the coastline more than 3 km from the MPA, therefore, **no in-combination effects possible.**
L/2017/00274	Power cable: operation and maintenance	Isle of Man to UK interconnector cable, maintenance and repair. Activities overlap the northern section of the MPA. **Possible in-combination effect.**
L/2022/00512	Physical sampling	Little Bipsham to Bipsham and Gynn square to cocker square coast protection scheme ground investigations, licence end date 19/12/23 and activities occurring on the coastline, more than 3 km from the MPA, therefore, **no in-combination effects possible.**
L/2023/00099	Cultural and heritage sites	St Anne's Pier truss replacements, licence end date 20/03/24, and activities occurring on the coastline, more than 3 km from the MPA, therefore, **no in-combination effects possible.**
L//2023/00258	Physical sampling	Morgan OWF intertidal geotechnical survey, licence end date 20/07/24, and activities occurring on the coastline, more than 3 km from the MPA, therefore, **no in-combination effects possible.**

[15] JNCC Pressures-Activities Database (PAD): hub.jncc.gov.uk/assets/97447f16-9f38-49ff-a3af-56d437fd1951 (Last accessed 27 August 2024).

[16] Details on the marine licence activities can be viewed on the public register of marine licence applications and decisions, searching by the marine licence case reference numbers: marinelicensing.marinemanagement.org.uk/mmofox5/fox/live/MMO_PUBLIC_REGISTER (Last accessed 27 August 2024).

The PAD and **Table 3** from **section 3.3**, were used to identify medium-high risk pressures exerted by fishing and non-fishing activities to identify those which require in-combination assessment (**Table 7**).

Table 7 summarises the pressures exerted by fishing and non-fishing activities and identifies those exerted by both (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 7: Pressures exerted by fishing and non-fishing activities.

	Marine licensable activities	Fishing activities	
Potential pressures	**See Table 6**	**Anchored nets and lines**	**Traps**
Abrasion or disturbance of the substrate on the surface of the seabed	Y	Y	Y
Removal of non-target species		Y	Y
Removal of target species		Y	Y

5.1 In-combination pressures section

Fisheries vs fisheries in-combination pressures will be considered in this section. The pressures exerted by the non-fishing activity will also be considered in-combination with the anchored nets and lines and traps fishing pressures.

5.2 Fishing vs fishing in-combination pressures

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

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

The annual average VMS records for over 12 m vessels within the MPA totalled 31 counts (0 counts for anchored nets and lines, and 31 counts for traps). For under 12 m vessels, between 2016 and 2020, the annual average fishing effort estimated to have been derived from the MPA via traps and anchored nets and lines was 8.75 (5.75 days for anchored nets and lines, and 3 days for traps, Annex 1). For the same period (2016-2020), the total fishing effort (under 12s) estimated to have been derived from the MPA were 44 days (28.75 for anchored nets and lines, and 14.99 for traps). The fishing effort data is further supported by the estimated live weight landings for under 12 m vessels (both UK and EU) that equal an annual average of 1.05 tonnes (0.3 tonnes for anchored nets and lines, and 1.02 tonnes for traps), between 2016 and 2020.

The combined impacts from anchored nets and lines and traps could potentially increase the risk of negative effects from the pressure abrasion and disturbance of the substrate on the surface of the seabed. However, due to the annual average of anchored nets and lines and traps effort being low (8.75 days) any in-combination impact is considered insignificant.

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

5.3 Fishing vs non-fishing activities in-combination pressures

5.3.1 'Abrasion and disturbance of the substrate on the surface of the seabed'

The designated features of Fylde MPA are sensitive to physical damage through surface abrasion and disturbance of the substrate from anchored nets and lines, and trap, during gear deployment, movement of the gear on the seabed due to tidal movements and storm activity, and as the gear is dragged along the seabed during retrieval.

The Isle of Man to UK interconnector cable maintenance and repair licence works involve a stretch of subsea cable that runs through Fylde MPA. Works involve cable de-burial, recovery, repair, re-burial, removal and replacement of rock mattress-ing or rock bags and use of jack up vessel in shallow water. The cable path overlaps both designated sand and mud features but over less than 20 % of the site. Activities are likely to cause abrasion pressures temporarily, through an ad-hoc repair and maintenance program, with a prediction of 80 % of sediment backfill naturally within 2 days. It is possible that activities in-combination with anchored nets and lines and traps may increase the potential for this pressure to have negative cumulative effects on the designated features of the MPA. However, due to the fairly low level of spatial overlap between licensed activities and the MPA and temporary nature of activities, it is unlikely there would be an adverse effect on site integrity.

There may be other operational submarine cables within the MPA, these cables are already in-situ and are unlikely to have any residual abrasion/removal pressure in-combination with the assessed fishing activity. Any abrasion/removal pressure from submarine cable operation and maintenance activity is unlikely to have a significant risk of in-combination impacts with the assessed fishing activity.

Therefore, MMO concludes that the combined pressures from anchored nets and lines and traps and other relevant activities will not result in a significant risk of hindering the achievement of the conservation objectives for the Fylde MPA.

5.4 Part C conclusion

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

Further management measures will not therefore be implemented for anchored nets and lines, and traps activities currently occurring within the MPA.

6 Conclusion and proposed management

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

Part B of this assessment concluded that, at the activity levels described, use of bottom towed gear may cause a significant risk of hindering 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, whilst anchored nets and lines, and traps will not.

Part C of this assessment concluded that at the activity levels described, use of anchored nets and lines and traps, in combination with each other and with other relevant activities, 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 Fylde 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[5] document.

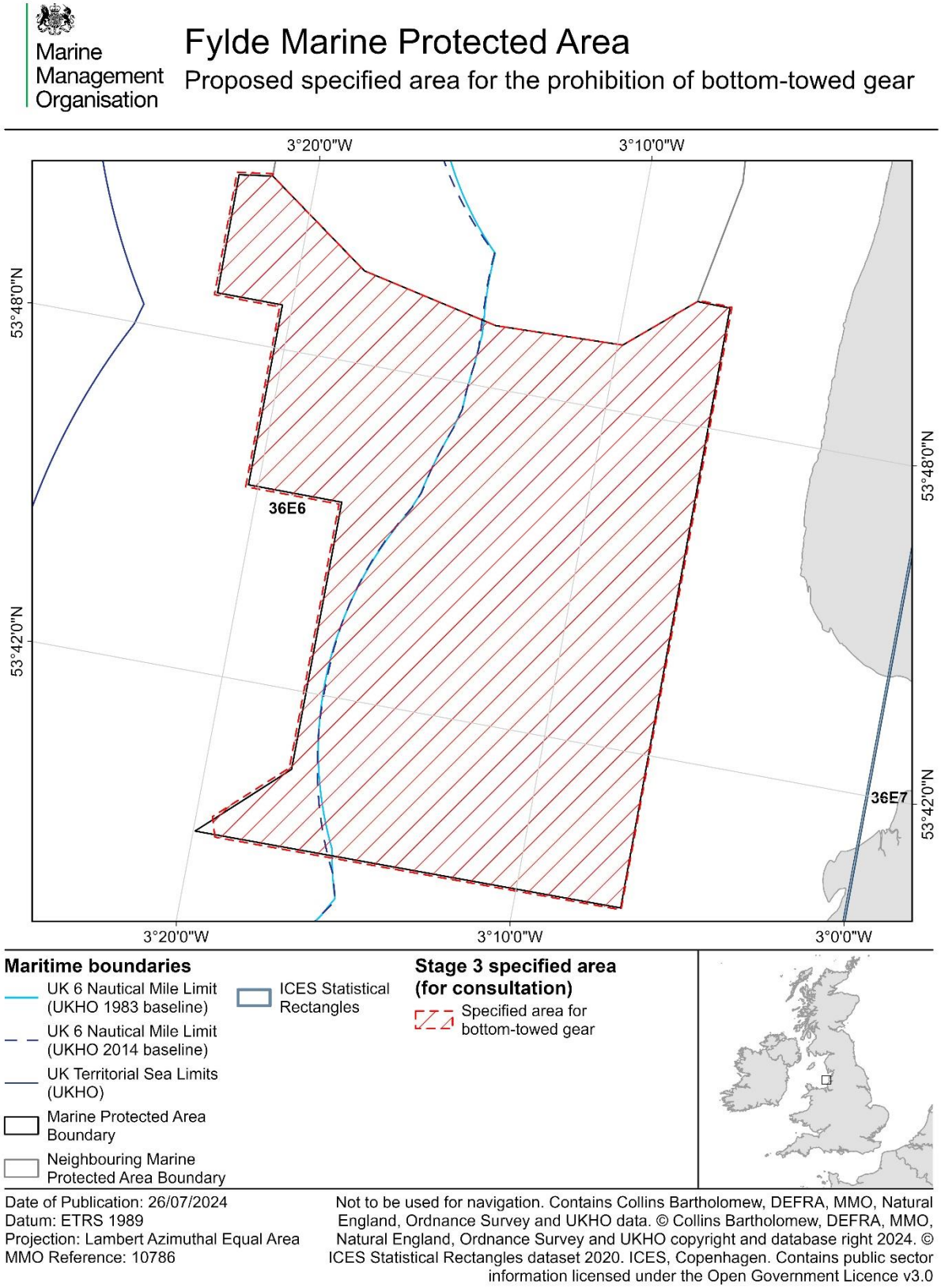

Figure 2: Map of proposed management.

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 and proportion per nation group, gear, gear group, and year (2016 to 2021) for Fylde MPA. All numbers are rounded to the nearest whole number.

			2016		2017		2018		2019		2020		2021		Total (2016 to 2021)		Annual average (2016 to 2021)
Gear group	**Gear code**	**Nation group**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**
Demersal trawl	**OTB**	UK	0	0	0	0	1	100	1	100	0	0	0	0	2	100	0
	OTB Total		**0**	**0**	**0**	**0**	**1**	**100**	**1**	**100**	**0**	**0**	**0**	**0**	**2**	**100**	**0**
Demersal trawl Total			**0**	**0**	**0**	**0**	**1**	**4**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**1**	**0**
Dredge	**DRB**	UK	0	0	1	100	0	0	0	0	0	0	0	0	1	100	0
	DRB Total		**0**	**0**	**1**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**100**	**0**
Dredge Total			**0**	**0**	**1**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**
Traps	**FPO**	UK	26	100	13	100	26	100	73	100	41	100	9	100	188	100	31
	FPO Total		**26**	**100**	**13**	**100**	**26**	**100**	**73**	**100**	**41**	**100**	**9**	**100**	**188**	**100**	**31**
Traps Total			**26**	**100**	**13**	**93**	**26**	**96**	**73**	**99**	**41**	**100**	**9**	**100**	**188**	**98**	**31**
Grand Total			**26**	**0**	**14**	**0**	**27**	**0**	**74**	**0**	**41**	**0**	**9**	**0**	**191**	**0**	**31**

Table A1.2. UK over 12 m live weight tonnage (t) estimates by gear for Fylde MPA.

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Demersal trawl	OTB	0	0	0.08	0.23	0	0.31	0.06
Demersal trawl	TBN	0	0	0	0	0	0	0
Demersal trawl total		**0**	**0**	**0.08**	**0.23**	**0**	**0.31**	**0.06**
Dredge	DRB	0	0.44	0	0	0	0.44	0.09
Dredge total		**0**	**0.44**	**0**	**0**	**0**	**0.44**	**0.09**
Traps	FPO	9.06	3.85	13.88	16.57	9.47	52.83	10.57
Traps total		**9.06**	**3.85**	**13.88**	**16.57**	**9.47**	**52.83**	**10.57**
Grand total		**9.06**	**4.29**	**13.96**	**16.8**	**9.47**	**53.58**	**10.72**

Table A1.3. Percentage overlap between ICES rectangles and Fylde MPA.

ICES rectangle	Percentage overlap (%)
36E6	2.10

Table A1.4. UK under 12 m live weight tonnage (t) estimates by gear for Fylde MPA.

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored Net/Line	GEN	0.01	0	0	0	0	0.01	<0.01
	GN	0.24	0.54	0.18	0.17	0.11	1.24	0.25
	GNS	0.02	0.03	0.01	0.01	0.04	0.11	0.02
	GTR	0.03	0.01	0.003	0.03	0.001	0.07	0.01
	LL	0	0.02	0.03	0.01	<0.01	0.06	0.01
Anchored Net/Line total		**0.29**	**0.59**	**0.22**	**0.22**	**0.16**	**1.48**	**0.30**
Demersal trawl	OT	0.12	0.10	0	0	0	0.22	0.04
	OTB	0	0.04	0.06	0.04	0.08	0.23	0.05
	OTT	0.63	0	0	0	0	0.63	0.13
	TBB	0.06	0.02	0.04	0.01	0.01	0.13	0.03
	TBN	0.24	0.22	0.15	0.02	<0.01	0.64	0.13
Demersal trawl total		**1.05**	**0.38**	**0.25**	**0.07**	**0.09**	**1.85**	**0.37**
Dredge	DRB	0.11	0.13	0.01	0.10	<0.01	0.35	0.07
Dredge total		**0.11**	**0.13**	**0.01**	**0.10**	**<0.01**	**0.35**	**0.07**
Midwater - Gill Drift	GND	<0.01	0	0	0	0	<0.01	<0.01
Midwater - Gill Drift total		**<0.01**	**0**	**0**	**0**	**0**	**<0.01**	**<0.01**
Midwater Hook/Lines	LHP	0	0.01	0.02	0.01	0	0.04	0.01
	LX	<0.01	0.01	0.04	0.02	0.11	0.18	0.04
Midwater Hook/Lines total		**<0.01**	**0.01**	**0.06**	**0.04**	**0.11**	**0.22**	**0.04**
Traps	FPO	0.01	2.37	0.45	1.38	0.84	5.05	1.01
Traps total		**0.01**	**2.37**	**0.45**	**1.38**	**0.84**	**5.05**	**1.01**
Unknown	MIS	0.05	0.01	0	0	0	0.05	0.01
Unknown total		**0.05**	**0.01**	**0**	**0**	**0**	**0.05**	**0.01**
Grand total		**1.52**	**3.50**	**0.99**	**1.81**	**1.21**	**9.01**	**1.80**

Table A1.5. EU under 12 m live weight tonnage (t) estimates by gear for Fylde MPA.

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Dredge	DRB	0	0	0	0.02	0	0.02	<0.01
Dredge Total		**0**	**0**	**0**	**0.02**	**0**	**0.02**	**<0.01**
Traps	FPO	0	0	0	0.03	0	0.03	0.01
Traps Total		**0**	**0**	**0**	**0.03**	**0**	**0.03**	**0.01**
Grand Total		**0**	**0**	**0**	**0.05**	**0**	**0.05**	

Table A1.6. Mean annual surface and subsurface SAR values for Fylde MPA.

Gear group	SAR category	2016	2017	2018	2019	2020
Demersal trawls	Surface	0	0.01	0.03	0.03	0.01
	Subsurface	0	<0.01	<0.01	<0.01	<0.01
Demersal seines	Surface	0	0	0	0	0
	Subsurface	0	0	0	0	0
Dredges	Surface	0	<0.01	<0.01	0	0
	Subsurface	0	0	<0.01	0	0
All Bottom Towed Gear	Surface	0	0.01	0.03	0.03	0.01
	Subsurface	0	<0.01	0	0	<0.01

Table A1.7. Fishing effort (days) recorded by gear type for ICES rectangle 36E6 from 2016 and 2020.

Gear group	Fishing effort (days at sea)						
	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Demersal trawl	4.60	4.26	5.48	3.17	2.06	19.57	3.91
Dredge	0.17	0.44	0.02	0.15	0.02	0.80	0.16
Bottom Towed Gear Total	**4.77**	**4.70**	**5.50**	**3.32**	**2.08**	**20.37**	**4.07**
Midwater Gill Drift	0.04	0	0	0	0	0.04	0.01
Midwater Hooks/Lines	0	0.44	0.65	0.48	0	1.58	0.31
Midwater Gear Total	**0.04**	**0.44**	**0.65**	**0.48**	**0**	**1.62**	**0.32**
Anchored Lines/Nets	6.87	7.18	4.73	4.79	5.19	28.75	5.75
Traps	0.13	4.05	3.19	4.87	2.75	14.99	3.00
Static Gear Total	**6.99**	**11.24**	**7.92**	**9.66**	**7.94**	**43.74**	**8.75**
Grand total	**11.80**	**16.38**	**14.07**	**13.46**	**10.02**	**65.73**	**13.15**