Marine Management Organisation

MMO Stage 3 Site Assessment: Foreland MPA (Draft)

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Title: MMO Stage 3 Site Assessment: Foreland MPA

Contents

Executive summary

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

The assessment finds that the ongoing use of bottom towed gear at the activity level described poses a significant risk of hindering the achievement of the conservation objectives of Foreland MPA. Management measures will therefore be implemented for bottom towed gear for Foreland MPA.

1 Introduction

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

Although the Marine Management Organisation (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 Kent and Essex Inshore Fisheries and Conservation Authority (IFCA) that MMO will assess Foreland MPA as a whole and not just the section beyond 6 nm.

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

2 Site information

2.1 Overview

The following Natural England conservation advice package 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:

- Natural England Conservation Advice – Foreland MCZ[1]
- Defra Factsheet - Foreland MCZ[2]

Foreland MPA is an inshore site located in the southern North Sea and English Channel, extending along the mid-channel between Kent and France and covering an area of 244 km^2 **(Figure 1)**.

Foreland MPA was designated as an MCZ in 2019 and contains an array of habitats ranging from subtidal sand to coarse sediments and rocky habitats which support and maintain a wide diversity of species.

The site's subtidal sand feature has been characterised as deep circalittoral rock covered with a thin veneer of sediment. The subtidal course sediment habitat in this site is characterised by calcareous tube worms, barnacles, and bryozoans. Both subtidal sand and coarse sediment are thought to have various species of commercially important flatfish present and therefore the site may be used as a spawning ground. Subtidal sediments dominate the site and provide habitats to animals such as worms, bivalve molluscs, burrowing anemones, and commercially important fish species such as sand eels.

The deep-water rock habitats are occupied by animal communities that thrive in moderate wave energy environments with limited sunlight such as encrusting corals, anemones, and sea squirts. Lobsters and crabs hide within the crevices, whilst a range of fish species, such as wrasse and topknots, forage around them making the site extremely species rich.

[1] Natural England Conservation Advice Package – Foreland MCZ: designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKMCZ0060 (Last accessed on: 23 August 2023).
[2] Defra Factsheet – Foreland MCZ: www.gov.uk/government/publications/marine-conservation-zones-foreland (Last accessed on: 23 August 2023).

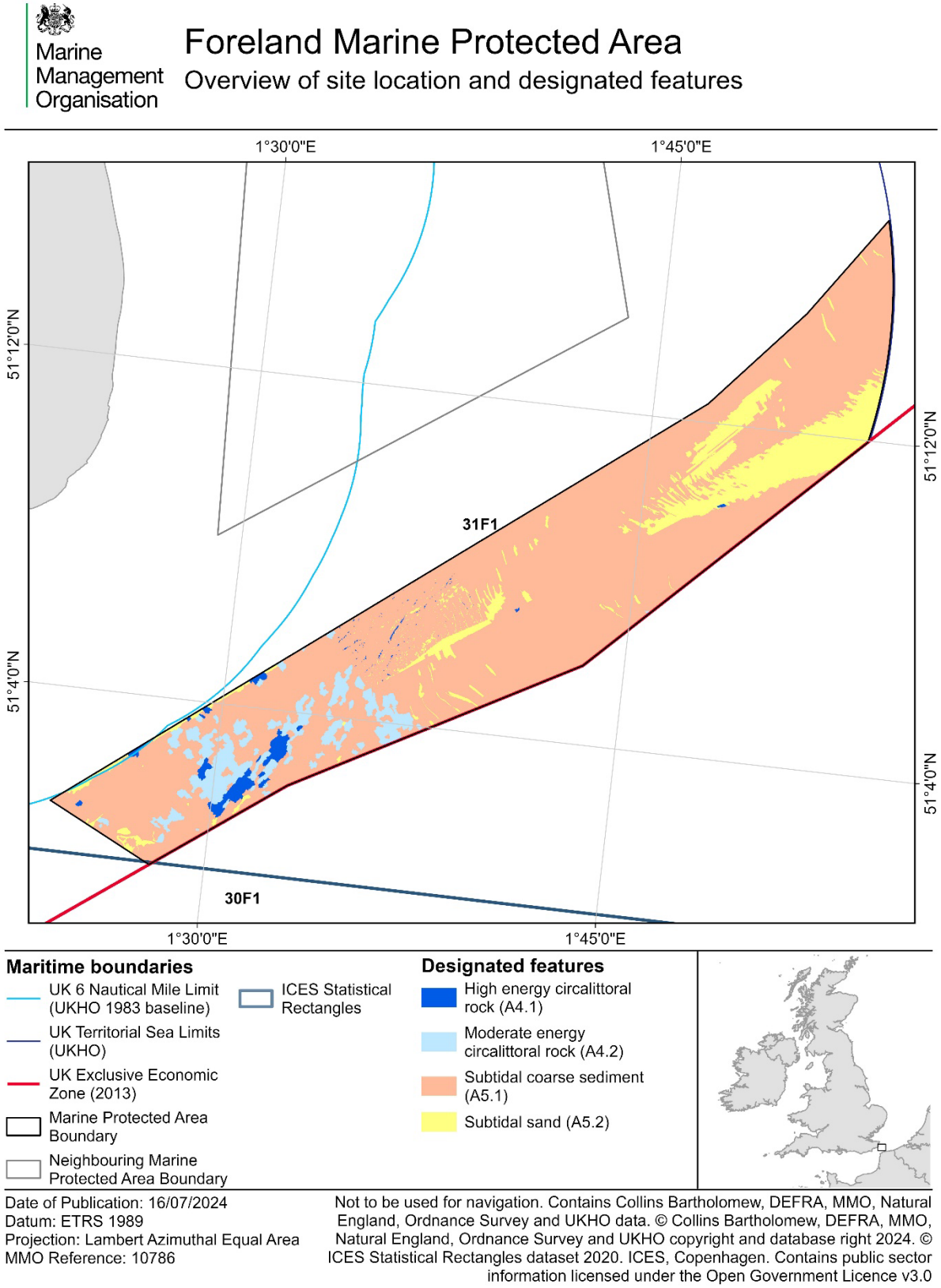

Figure 1: Site overview map.

The designated features and their general management approaches are set out below in **Table 1**.

Table 1: Designated features, and general management approaches.

Designated feature	General management approach
English Channel outburst flood feature	Maintain in favourable condition
Subtidal sand	
Subtidal coarse sediment	Recover to favourable condition
High energy circalittoral rock	
Moderate energy circalittoral rock	

There is no feature condition assessment available for this site; in its absence a vulnerability assessment conducted at the time of designation, which includes sensitivity and exposure information for features and activities in a site, is used as a proxy for condition.

Biotope data for features within Foreland MPA are only available at the bioregion level for the Eastern Channel. The recover objective has been set due to the presence of fishing activity within the site, in particular the use of bottom towed gear. More information on this can be found in Natural England's supplementary advice on conservation objectives[1].

2.2 Scope of this assessment

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

3 Part A - Identified pressures on the MPA

Part A of this assessment was carried out in a manner that is consistent with the 'capable of affecting (other than insignificantly)' test required by section 126 of the Marine and Coastal Access Act 2009[3].

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

1. The pressure-feature interactions **are not** included for assessment in Part B and screened out:
    a. if the feature is not exposed to the pressure, and is not likely to be in the future;
    b. 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: www.legislation.gov.uk/ukpga/2009/23/section/126.

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

- VMS data;
- fisheries landings data (logbooks and sales records);
- 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 Stage 3 MPA Site Assessment Methodology document[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 Foreland MPA.

Gear type	Gear name	Gear code	Justification
Anchored nets and lines	Combined gillnet-trammel net	GTN	Present in VMS and under 12 m landings data from ICES statistical rectangles overlapping the site.
	Longline (unspecified)	LL	Present in under 12 m landings data from ICES statistical rectangles overlapping the site.
	Longlines (demersal)	LLS	
	Set gillnet (anchored)	GNS	Present in VMS and under 12 m landings data from ICES statistical rectangles overlapping the site.
	Trammel net	GTR	
Bottom towed gear	Beam trawl	TBB	
	Bottom otter trawl	OTB	
	Danish / anchor seine	SDN	Present in VMS landings data.
	Otter trawls (unspecified)	OT	Present in VMS and under 12 m landings data from ICES statistical rectangles overlapping the site.
	Scottish / fly seine	SSC	
	Pair seine	SPR	Present in VMS landings data.
	Seine (unspecified)	SX	
	Towed dredge	DRB	Present in VMS and under 12 m landings data from ICES statistical rectangles overlapping the site.
	Twin bottom otter trawl	OTT	

[4] Stage 3 MPA Site Assessment Methodology document: www.gov.uk/government/publications/stage-3-site-assessments (last accessed 09 August 2024).

Gear type	Gear name	Gear code	Justification
Midwater gear	Drift gillnet	GND	Present in under 12 m landings data from ICES statistical rectangles overlapping the site.
	Hand-operated pole-and-line	LHP	
	Hook and line (unspecified)	LX	
	Jigging or trolling line	LTL	
	Midwater otter trawl	OTM	Present in VMS landings data and in UK under 12 m landings data from ICES rectangles overlapping the site
	Midwater pair trawl	PTM	
Traps	Pot / creel	FPO	Present in under 12 m landings data from ICES statistical rectangles overlapping the site.
	Trap	FIX	
Miscellaneous	Unknown	NK	Present in VMS data.

3.2 Pressures, features and activities screened out

This section identifies activities, features and pressures that are **occurring but do not need to be considered** for Foreland MPA.

The gear types, features and interactions screened out on this basis are listed below with justification:

- **Midwater gears:** although the use of midwater gears does occur within Foreland 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 Foreland MPA is not considered to be capable of affecting the designated features other than insignificantly and is not considered further within this assessment.
- **Geological or geomorphological designated features:** These features are out of scope for this assessment as fishing activities are considered incapable of significantly impacting these features.
- **Bottom towed gear interactions with the features high energy circalittoral rock and moderate energy circalittoral rock:** These interactions have not been included in this assessment as they have already

been addressed in the Stage 2 assessment of Foreland MPA[5]. Stage 2 assessed the impacts of fishing using bottom towed gears on rock, rocky and biogenic reef in 13 MPAs. These features were chosen for Stage 2 as they are some of the most sensitive to the impacts of bottom towed gears. Management measures will be introduced to restrict the use of bottom towed gear over these features.

- **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 the anchored nets and lines, bottom towed gear and traps Impacts Evidence documents:

- Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines[6];
- Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear[7]; and
- Stage 3 Fishing Gear MPA Impacts Evidence Traps[8].

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.

[5] Stage 2 MPA Fisheries Assessment: assets.publishing.service.gov.uk/media/65bb6d583e26be0011e47e23/Stage_2_MPA_Fisheries_Assessment.pdf (last accessed 08 September 2023).
[6] Stage 3 Fishing Gear MPA Impacts Evidence Anchored Nets and Lines: www.gov.uk/government/publications/stage-3-impacts-evidence (last accessed 09 August 2024).
[7] Stage 3 Fishing Gear MPA Impacts Evidence Bottom Towed Gear: www.gov.uk/government/publications/stage-3-impacts-evidence (last accessed 09 August 2024).
[8] Stage 3 Fishing Gear MPA Impacts Evidence Traps: www.gov.uk/government/publications/stage-3-impacts-evidence (last accessed 09 August 2024).

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**.

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 Foreland MPA to be taken forward to Part B.

Potential pressures	Designated features									
	High energy circalittoral rock		Moderate energy circalittoral rock		Subtidal coarse sediment			Subtidal sand		
	A	T	A	T	A	B	T	A	B	T
Abrasion or disturbance of the substrate on the surface of the seabed										
Barrier to species movement										
Changes in suspended solids (water clarity)										
Deoxygenation										
Hydrocarbon and polycyclic aromatic hydrocarbon (PAH) contamination										
Introduction of light										
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 sediment type)										
Removal of non-target species										
Removal of target species										
Synthetic compound contamination										
Transition elements and organo-metal contamination										

Table 4: Relevant favourable condition targets for identified pressures.

Attribute	Target	Relevant pressures
Distribution: presence and spatial distribution of biological communities	Recover the presence and spatial distribution of all circalittoral rock and coarse sediment communities. Maintain the presence and spatial distribution of subtidal sand communities.	• Abrasion/disturbance of the substrate on the surface of the seabed. • Removal of non-target species. • Removal of target species. • Changes in suspended solids (water clarity)*. • Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion*. • Smothering and siltation rate changes*.
Extent and distribution	Recover the total extent and spatial distribution of subtidal coarse sediment and all circalittoral rock [subject to natural variation in sediment veneer]. Maintain the total extent and spatial distribution of subtidal sand.	
Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species within each feature, to enable each of them to be a viable component of the habitat.	
Structure: physical structur of rocky substrate	Recover the surface and structural complexity, and the stability of the reef structure.	
Structure: sediment composition and distribution	Recover the distribution of coarse sediment composition types across the feature. Maintain the distribution of subtidal sand composition types across the feature.	
Structure: species composition of component communities	Recover the species composition of component communities within subtidal coarse sediment, high and moderate energy circalittoral rock. Maintain the species composition of subtidal sand component communities.	

* Only relevant to pressures from bottom towed gear on subtidal coarse sediment and subtidal sand.

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[3].

Table 3 shows the fishing activities and pressures identified in Part A which have been included for assessment in Part B. The most relevant attributes of the designated features that could be compromised by fishing pressures were identified using the Foreland MPA conservation advice package[1] and are shown in **Table 4**.

4.1 Fisheries access and existing management

Foreland MPA lies predominantly within the 6 to 12 nautical mile (nm) zone, the only non-UK vessels that can operate within the site are those from France, Belgium, Germany and the Netherlands licensed by the UK to do so. While VMS records indicate that flag states of vessels operating within the MPA from 2016 to 2020 included the UK, Belgium, Germany, France, Faroe Islands and the Netherlands, it is likely that vessels from nations other than those listed as permitted above were transiting through the site, rather than fishing. VMS records indicate that French vessels were most prevalent in the period under consideration. More information on non-UK vessel access to UK waters can be found on MMO's Single Issuing Authority page[9].

The Kingfisher fishing restriction map (Seafish, 2023) contains information on MPA management measures for the portion of the site inside of 6 nm. Foreland MPA is subject to the following relevant legislative catch restrictions that are applicable to fisheries occurring in this portion of the site:

- **Vessel size and engine power** - prohibiting vessels greater than 17 m in length from fishing within the [Kent and Essex Inshore and Fisheries] District and vessels with an engine power greater than 221 kilowatts (kW) (or 243 kW before derating) from using towed gear;
- **Dredging for mussels** - restricting the methods by which fishers can dredge for mussels within a given area of the District;
- **Dredging for scallops** - restricting the methods by which fishers can dredge for scallops within a given area of the District;
- **Limitation on quantities and minimum size of mussels** - limiting the maximum fishing effort and minimum size a mussel can be removed from the fishery;

[9] The UK Single Issuing Authority: www.gov.uk/guidance/united-kingdom-single-issuing-authority-uksia (Last accessed on: 23 August 2023).

- **Small mesh trawl nets** - giving the Authority the power to restrict the use of trawl nets below a certain mesh size.

More information on these byelaws can be found on Kent and Essex IFCA's website[10]. MMO will continue to engage directly with IFCAs regarding recommended management measures nearby/adjacent to their areas of jurisdiction.

Foreland MPA is subjected to the following MMO byelaw:

- Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023[11] – prohibiting the use of bottom towed gear within specified areas of the MPA which contain moderate and high energy circalittoral rock.

4.2 Fishing activity summary

Table A1.1 to **Table A1. 8** in **Annex 1**: Fishing activity data display a detailed breakdown of fishing activity within Foreland MPA. Of the fishing activities not screened out in Part A of this assessment, the most prevalent gears operating within the site were demersal trawling, demersal seine netting, and anchored nets and lines.

When discussing weights and values from landings in this section, figures used are a total from UK and EU member states.

Anchored nets and lines

VMS data show the use of three different types of anchored nets and lines within Foreland MPA by vessels over 12 m in length: set gillnets (anchored), combined gillnets-trammel nets, and trammel nets with an annual average of 366 records for this gear group between 2016 and 2021, and annual average landings of 0.25 t between 2016 and 2020. Anchored net and line activity from these vessels mostly occurred in the eastern portion of the site, with only a few instances of this gear used in the site's far southwest corner.

This gear group was more commonly used by vessels under 12 m, with average annual landings of 21.01 t between 2016 and 2020, and a total of 442.16 fishing effort days in the period under consideration, making this the second most commonly used gear type for under 12 m vessels. Landings by this fishing method for this vessel group have nevertheless decreased year on year from 29.48 t in total for 2016 to 11.21 t in 2020.

[10] Kent and Essex IFCA Byelaw Summary: www.kentandessex-ifca.gov.uk/i-want-to-find-out-about/regulations/keifca-byelaws (Last accessed on: 23 August 2023).
[11] Marine Protected Areas Bottom Towed Gear Byelaw 2023: assets.publishing.service.gov.uk/media/65bb6a79c4734a000dd6cb78/Marine_Protected_Areas_Bottom_Towed_Fishing_Gear_Byelaw_20231.pdf (Last accessed on: 16 July 2024)

Bottom towed gear

For vessels over 12 m in length, VMS data from 2016 to 2021 show demersal trawls to be the most common gear type used within Foreland MPA, with an annual average of 2,795 VMS records between 2016 and 2021, 86 % from vessels using bottom otter trawls. By contrast, demersal seine usage averaged 1,003 records annually, while for dredge activity there was just one VMS record in the whole six-year period.

Bottom towed gear activity for over 12 m vessel occurred throughout the site, with higher concentrations of activity in the west and southeast. Landings for these vessels using demersal trawls and demersal seines respectively averaged 367.03 t and 114.26 t annually between 2016 and 2020.

Vessels under 12 m in length also used bottom towed gear within the site, with landings data showing that demersal trawls averaged 8.47 t of landings annually between 2016 and 2020, whilst vessels employing dredges landed an average of 11.57 t per year. However, a peak of 45.89 t in dredge landings in 2020 skews the annual average for this gear type higher, with landings otherwise ranging between 2.02 t and 4.86 t.

Swept area ratio (SAR) analysis indicates that demersal trawl activity increased over the 5-year period. Total mean surface SAR values for C-squares intersecting Foreland MPA range between 5.79 and 15.62 for all demersal gears (trawl, seine, and dredge) and mean subsurface values between 0.39 and 1.23. A SAR value of 1 means that each area C-square experiences a pass of fishing gear on average once a year therefore these values indicate that bottom towed gear is sweeping the entirety of the site up to 15 times per year.

Traps

Traps were the most productive gear type used by vessels under 12 m in length within ICES rectangle 31F1 and then apportioned to the site, with annual average landings between 2016 and 2020 of 64.67 t. Fishing effort data show that a total of 500.55 days over the 2016 to 2020 period were spent fishing using traps, with a peak of 146.87 days in 2016.

There are no landings data or VMS records showing trap usage by vessels over 12 m in length in the MPA, suggesting larger vessels did not fish using this gear type in the site during the period under consideration.

4.3 Pressures by gear type

The Stage 3 Fishing Gear MPA Impacts Evidence documents for anchored nets and lines[6], bottom towed gear[7] and traps[8] 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.

The designated features subtidal coarse sediment and subtidal sand have been considered together, as have high energy and moderate energy circalittoral rock due to their similar sensitivities to the pressures identified for different gear types. 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 (i.e. key structural or influential species). This may occur through intentional or unintentional catch associated with the act of commercial fishing. For the purposes of benthic feature assessments, the physical effects of fishing gears on seabed communities are best addressed through the assessment of abrasion and penetration pressures. As there are no designated species features associated with Foreland 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 SNCBs.

For the purposes of this assessment, the physical aspects of these pressures, such as damage, are assessed more completely within the abrasion and penetration pressures, so where features are sensitive to both abrasion and penetration and removal of target and non-target species pressures, only abrasion and penetration will be considered. Biotopes sensitive to the removal of target/non-target species but not sensitive to abrasion/penetration pressures are given further consideration.

4.3.1 Anchored nets and lines

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

Subtidal sediment features

The relevant pressure on subtidal sediment features of Foreland MPA from anchored nets and lines was identified in **Table 3** and are:

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

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

Section 4.2 describes the fishing activity within Foreland MPA and VMS activity data show that the use of anchored nets and lines during the period under consideration occurred within the MPA predominantly over the sediment features.

Section 9.4 of the anchored nets and lines Impacts Evidence document[6] combines relevant research and finds that abrasion impacts from this gear type are unlikely to negatively impact the extent or distribution of any sediment feature or structure and function of the ecosystem in a significant manner. Generally 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. Abrasion impacts are greater on stable habitats such as subtidal coarse sediments and subtidal muds compared to mobile subtidal sands as the coarser habitats often contain populations of slower growing epifauna therefore recovery is likely to take longer (Collie *et al.*, 2000).

The biotopes identified as being relevant to the sediment features within Foreland MPA can be found in Natural England's Advice on Operations[1] which listed European Nature Information System (EUNIS) biotopes that were present or likely to be present within the Eastern channel bioregion and potentially in the MPA. Only one biotope listed has medium sensitivity to the abrasion pressure, '*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand' (De-Bastos *et al.*, 2023a). This biotope has low resistance and medium resilience due to the fragility of the echinoderm. However, the infaunal habitat of this species does offer it some protection to the abrasion pressure as it lives below the surface within the fine sandy sediment. Furthermore, whilst this biotope is present within the bioregion, there are no known records of it present within the site based on current best available evidence.

At the activity levels described, alongside the static nature of anchored nets and lines and their small footprint, the physical structure of sedimentary features is unlikely to be impacted, and characterising benthic communities are likely to be relatively unaffected.

Moderate and high energy circalittoral rock (rocky reef)

The relevant pressures on the rocky reef features of Foreland 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 target species; and
- removal of non-target species.

The biotopes identified as being relevant to both the moderate and high energy circalittoral rock features within Foreland MPA can be found within Natural England's Advice on Operations[1] which includes the biotopes sensitivities to the abrasion pressure, removal of target species and non-target species pressures. Of the 27 possible biotopes, 14 of them have a medium sensitivity to the abrasion pressure

and the remaining 13 have low sensitivity. The medium sensitivities are categorised as such due to the emergent fragile fauna characterising the biotopes which have little to no protection from surface abrasion. Species include bryozoans, hydroids, sponges, piddocks and *Sabellaria* species (Tillin, Gibb and Garrard, 2015; Readman, 2016b; Tillin and Hiscock, 2016; Readman, 2016a; Tillin, 2016; Tillin and Hill, 2016; Tyler-Walters, Mainwaring and Williams, 2022; De-Bastos *et al.*, 2023b; Tillin *et al.*, 2023; Readman, K. A. Lloyd and Watson, 2023; Readman, K.A. Lloyd and Watson, 2023b, 2023d, 2023a, 2023c). Circalittoral faunal communities in variable salinity, is one of the biotopes with medium sensitivity but will no longer be considered within this assessment as the site is fully saline, not variable.

Section 7.1 within the anchored nets and lines Impacts Evidence document[6] describes the sensitivities of the numerous biotopes found within these habitats in the MPA. Two biotopes within the moderate circalittoral rock feature have medium sensitivity to the abrasion pressure however one has no resistance and high resilience, and one has medium resistance and very low resilience. These differences are due to the sensitivities of not only the epifauna in the biotope, but also the sensitivity of the substratum they live on and within. For example, species such as Piddocks, *Pholas dactylus,* and sponges *Dysidea fragilis* and *Suberites carnosus* found in these biotopes are extremely vulnerable to abrasion, following removal of the substratum that they live in, no recovery of the habitat is possible (Tillin and Hill, 2016).

Rocky reefs contain a mosaic of communities and biotopes within the features. Section 7.3 within the anchored nets and lines Impacts Evidence documents[6] covers a wide range of research illustrating the sensitivities to the abrasion pressure. Benthic impacts most commonly occur during the setting and retrieval of gears with anchors and foot rope coming into direct contact with the seabed and damaging epifaunal and epifloral communities. However, physical damage to the rock itself is unlikely to occur. Furthermore, species such as *Alcyonium digitatum*, algal crusts and faunal turf communities, which are common biotopes within the MPA, are found to be not vulnerable to damage from abrasion from a single abrading event, and as discussed in section 4.2 the majority of activity occurring within the site is happening over the sediment features. (Stamp and Williams, 2021). Species listed within these biotopes have good recoverability as they reach sexual maturity quickly, reproduce asexually, have good local recruitment and some species can regenerate from broken fragments, however impacts would increase in an incremental nature with increase fishing activity (Readman and Williams, 2021). It should also be noted that the main habitat complexities within the rocky reef features is provided by crevices, fissures and overhangs which offer the diverse array of fauna some protection from the abrasion pressure.

As per **section 4.2**, VMS data for vessels over 12 m in length show that the use of anchored nets and lines does occur within the site, however this predominantly took place over the sediment features. Landings data for the under 12 m fleet do not

indicate where activity occurs, and so the use of anchored nets and lines by these vessels may be occurring over the rock reef features. However, landings data shows that this method of fishing has decreased in the site from under 12 m vessels. Nevertheless, targeted research on the impacts of netting on reef is extremely limited and it should be noted that sensitivity to removal via abrasion was predominantly linked to studies using bottom towed gears rather than anchored nets and lines.

Biological communities within the Eastern Channel and Foreland MPA are subjected to high levels of hydrodynamic activity and will therefore be used to some level of disturbance and have a degree of resilience to the abrasion pressure. Furthermore, medium sensitivity biotopes within the features are more resilient to anchored nets and lines due to the small footprint of the gear type reducing the abrasion pressure. From the activity levels described and the potential impact on the feature anchored nets and lines do not have the ability to alter the physical structure of rocky reef or sediment composition due to the small footprint and impact of the gear type. Therefore, **MMO conclude that the ongoing use of anchored nets and lines at the activity level described does not pose a significant risk of hindering the achievement of the conservation objectives of Foreland MPA.**

4.3.2 Bottom towed gear

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

Interaction with high energy circalittoral rock and moderate energy circalittoral rock are not considered in the below assessment as they have already been addressed in the Stage 2 assessment of Foreland MPA[5].

Subtidal sediment features

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

- abrasion or disturbance of 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*.

Pressures marked with matching superscript symbols (*) have been consolidated in this assessment due to the similar nature of their impacts on the sediment features.

As described in **section 4.2** demersal trawling is the most commonly used gear type within Foreland MPA and occurs over both sediment features of the site. Dredge use within the site was only by vessels under 12 m in length, however landings data for the 12 m fleet does not indicate where the activity occurred within Foreland MPA. The use of dredges may therefore have taken place over the designated sediment features. VMS activity data shows extremely limited dredging, with only one record in

2020. However, both landings' data and VMS records show demersal trawling and demersal seine activity.

Section 8.4.1 within the bottom towed gear Impacts Evidence document[7] collates and documents best available research on the impacts of abrasion to sediment features and finds communities that characterise subtidal coarse sediment are particularly sensitive to bottom towed gear activity because they generally contain large portions of long-lived 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. As the mud fraction of sand increases (for example muddy sand vs coarse sand) recovery times also increase, making muddy sediments more sensitive. The subtidal sand habitat within the MPA is described as deep circalittoral rock covered with a thin veneer of sediment (Mitchell and Murray, 2020). Due to their nature thin veneer habitats are likely to be more sensitive than more typical subtidal habitats.

Natural England's Advice on Operations[1] has been used to identify possible biotopes within the Foreland MPA based on the Eastern Channel bioregion. There are seven biotopes within the sediment features, one of which has a medium sensitivity to both the abrasion/disturbance and the penetration pressures associated with bottom towed gear, this is '*Echinocardium cordatum* and *Ensis* spp. in lower shore and shallow sublittoral slightly muddy fine sand' (De-Bastos *et al.*, 2023a). *E. cordatum* is fragile and is likely to be damaged by an abrasive force, such as movement of trawling gear over the seabed. The two key species in the biotope, *E. cordatum* and *Ensis ensis* are infaunal found close to the sediment surface. This life habit provides some protection from abrasion at the surface but would do little against the penetration pressure. The remaining biotopes (McQuillan and Tillin, 2006; Readman and Garrard, 2019; Tillin, Tyler-Walters and Garrard, 2019; Tyler-Walters and Garrard, 2019; Tillin, 2023; Tyler-Walters and Tillin, 2023) contain species which are smaller, short lived, opportunistic species that exhibit greater resilience to anthropogenic activity and have a low to not sensitive rating to the abrasion/disturbance and penetration pressures, however this assessment is based on a benchmark of a single abrasive event and at the SAR values described in **section 4.2**, it would mean biotopes with a low sensitivity to the abrasion pressure would be unable to recover between abrasion events, impacting the designated feature and affecting the attributes of the site which have a recover condition target.

Foreland MPA is subjected to moderate to high wave energy and strong tidal currents, therefore species within the site are accustomed to some amount of turbidity and siltation. However, abrasion events caused by the passing of fishing gear or scour by objects on the seabed surface 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 affecting seabed sedimentation rates. Only one biotope within the subtidal sand feature has sensitivity (low) to this pressure with medium resistance (Tillin, Tyler-Walters and Garrard, 2019) nonetheless SAR value indicates the whole of the surface of the site is coming into contact with bottom towed gear as much as 15 times in one year creating a continuous turbid environment with no time for recovery of biotopes in between each event. This activity would impact diatom productivity and therefore reduce feeding of some characterising species within the designated feature.

The pressures identified in **Table 3** for the sediment features from bottom towed gear may not have an impact on the spatial distribution of the sediment features due to the mosaic nature of the subtidal sediments present. However, at the activity level described, the research discussed above, and the high spatial footprint of the activity, MMO considers that bottom towed gear will have an impact on both the extent and distribution of the biological communities present. It also has the potential to alter the species composition within the subtidal sediments reducing the presence and abundance of key structural and influential species. Therefore, **MMO concludes that the ongoing use of bottom towed gear at the activity level described poses a significant risk of hindering the achievement of the conservation objectives of Foreland MPA.**

4.3.3 Traps

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

Subtidal sediment features

The relevant pressure on subtidal sediment features of Foreland MPA from traps was identified in **Table 3** and are;

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

As discussed in **section 4.2**, landings data show the use of traps occurring within the site by vessels under 12 m in length, however this data does not show the location of fishing activity; trap usage may therefore have been taking place over all designated sediment features. 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. As per section 9.4 of the traps Impacts Evidence document, abrasion impacts from this gear type are unlikely to be a concern unless they occur where particularly sensitive species are present or when fishing occurs at damaging levels of intensity.

The biotopes identified as being relevant to both the sediment features within Foreland MPA can be found within Natural England's Advice on Operations[1] which includes the biotopes sensitivities to the abrasion pressure from traps. As discussed in **section 4.3.2**, there is only one biotope with a medium sensitivity to the abrasion pressure owing to the key species within the subtidal sand biotope, *Echinocardium cordatum* and *Ensis ensis*. These species may be fragile to the abrasion pressure; however, their subsurface habitat is likely to protect them so that the risk of abrasion from traps is minimal. Furthermore, the impacts of traps on subtidal sediments are of limited concern due to the high energy environment where the features occur and the small spatial footprint of the gear type. Traps are therefore unlikely to significantly impact the physical structure of the features.

Moderate and high energy circalittoral rock (rocky reef)

The relevant pressures on the rocky reef features of Foreland MPA from traps were identified in **Table 3** and are;

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

Section 7.3 within the traps Impact Evidence documents[8] highlights the research on the impacts of traps and the effects of the abrasion pressure on rocky reef features, finding that traps are unlikely to impact the rocky substrate itself, but may impact the associated taxa.

Natural England's Advice on Operations[1] identifies biotopes relevant to the moderate and high energy circalittoral rock features within Foreland MPA, including the biotopes sensitivities to the abrasion pressure from traps. Numerous different biotopes make up the high and moderate energy circalittoral rock habitats, making the sensitivity of rocky reef habitats highly variable. Sensitivities of biotopes within Foreland MPA range from low to medium due to the key species within the biotopes and how the abrasion pressure impacts them. Many of the biotopes with medium sensitivities (Tillin, Gibb and Garrard, 2015; Readman, 2016b, 2016a; Tillin, 2016; Tillin and Hill, 2016; Tillin and Hiscock, 2016; Tyler-Walters, Mainwaring and Williams, 2022; De-Bastos *et al.*, 2023b; Tillin *et al.*, 2023; Readman, K. A. Lloyd and Watson, 2023; Readman, K.A. Lloyd and Watson, 2023c, 2023d, 2023b) have low resistance to the abrasion pressure such as *Polydora* sp. tubes on moderately exposed sublittoral soft rock (De-Bastos *et al.*, 2023b), this is because they are species that protrude from the surface of the reef and are vulnerable to abrasion. However, due to their habitats and ecology they have medium to high resilience meaning the biotopes would recover swifty after abrasion as many of the species

listed in the biotopes reach sexual maturity quicky, reproduce rapidly and can undertake resting stages that are resistant to environmental perturbation.

Section 7.5 in the traps Impact Evidence documents[8] highlights that the majority of literature before 2015 has suggested that traps are unlikely to significantly impact rocky reef biotopes. It further discusses that more recent studies suggest that traps will have negative impacts on the biological functions of reef habitats at increased spatial and temporal densities and has shown that upright and branching species that protrude from the reef (such as sponges or bryozoans) were found to be particularly vulnerable to damage from the hauling of pots. However, the main habitat complexities within the rocky reef features are provided by crevices, fissures and overhangs which offer the diverse array of fauna some protection from the abrasion pressure.

As describes in **section 4.2,** trapping activity occurs within the site although there is uncertainty as to the location of activities by the under 12 m fleet; therefore there is a possibility of trap usage occurring over the rocky reef designated features. However, as described in section 7.4 of the trap Impacts Evidence documents[8], traps are much smaller than mobile bottom towed gears which makes it unlikely that traps fished commercially would land, soak and haul in exactly the same location on successive fishing trips, reducing the intensity and impact of the abrasion pressure on the biotopes within the designated features.

The impacts of traps on sediment features are unlikely to affect the extent and distribution of the designated sediment features within Foreland MPA or impact the abundance of key listed species within the features. The use of traps on the rocky reef feature will not affect the extant and distribution of the feature nor the physical structure of the rocky reef. The use of traps on the rocky reef feature has the potential to affect key species and sensitive epifauna within the biotopes through the abrasion pressure however as discussed above and within section 7.1 of the traps Impacts Evidence documents[8], many of the medium sensitive biotopes are afforded protection from crevices and overhangs and many species have a fast recovery rate to the abrasion pressure. The described activity levels in 4.2 also illustrates that only under 12 m vessels used traps in the MPA with an average annual landing of 64.67 t.

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

4.4 Part B conclusion

The assessment of anchored nets and lines, bottom towed gear and traps on high energy circalittoral rock, moderate energy circalittoral rock, subtidal coarse sediment and subtidal sand features of Foreland 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 Foreland 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 effects with those of the fishing activities assessed. A 5 km buffer was therefore applied to the site boundary to identify relevant activities. This assessment considers the in-combination impacts of marine licensable activities that are ongoing or upcoming, and with medium to high-risk pressure impact pathways as permitted fishing activity. As the models were run using ArcGIS in August 2023, any licences that ended before this date were screened out of the assessment.

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

There may be historic and operational cables within the buffer of this MPA, these cables are already in-situ, and it is unlikely that there is any direct or indirect pressure pathway for impact and therefore, it is unlikely that there will be any in-combination effects.

Bottom towed gear was 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 Foreland 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 6 projects, within the MPA with the 5 km buffer applied. **Table 5** shows this activity and the relevant category from the JNCC Pressures-Activities Database (PAD)[12].

Table 5: Summary of marine licensable activities and associated PAD categories.

Marine licence case reference number[13]	PAD Category	Description
MLA/2020/00262	Power cable: Operation and maintenance Power cable: Laying, burial and protection Dredge and spoil disposal	GridLink Interconnector. Electricity interconnector, linking the existing electricity grids in the UK and France. The planned cable route goes through the northeast section of the MPA. **Possible in-combination pressure pathway.**
MLA/2020/00264	Construction of new works Sampling	Installation of an offshore communications tower in UK territorial waters. Project Aquarius. Outside site boundary. **No direct or indirect pressure pathway for impact and therefore, no in-combination effects possible.**

[12] JNCC Pressures-Activities Database (PAD*)*: hub.jncc.gov.uk/assets/97447f16-9f38-49ff-a3af-56d437fd1951 (Last accessed: 25 May 2024)

[13] Public register of marine licence applications and decisions: marinelicensing.marinemanagement.org.uk/mmofox5/fox/live/MMO_PUBLIC_REGISTER (Last accessed: 25 May 2024)

Marine licence case reference number[13]	PAD Category	Description
MLA/201500366/3	Construction of new works	Install and operate a self-powered offshore platform to support a mast. This platform will also mark the Sandettie Bank in conjunction with the Trinity House Buoys and therefore provide further support for sea users. Outside site boundary. **No direct or indirect pressure pathway for impact and therefore, no in-combination effects possible.**
MLA/2023/00222	Sampling	The Crown Estate will be undertaking vibrocore sampling across several areas in English waters. **Pressure pathway. Two locations to the east of the site. More information in the MLA case**
MLA/2022/00564	Aggregate dredging	Dredge Area 530 for marine aggregate. Outside of site boundary. **No direct or indirect pressure pathway for impact and therefore, no in-combination effects possible.**
MLA/2013/00072/4	Construction of new works and navigational dredging	Nemo Link - UK to Belgium Interconnector. To increase the transmission capacity between countries. Outside site boundary. **No direct or**

Marine licence case reference number[13]	PAD Category	Description
		indirect pressure pathway for impact and therefore, no in-combination effects possible.

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 5**).

Table 6 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 6: Pressures exerted by fishing and non-fishing activities.

	Non-fishing activities	Fishing activities	
Potential pressures	**Cable laying and sampling**	**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

5.1 In-combination pressure sections

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 pressures

As noted in part B (**section 4.3.1** anchored 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 abrasion pressure as the details of key structural and influential species is yet to be defined. Therefore, the removal pressure may require further consideration as future evidence becomes available in conjunction with updated conservation advice from JNCC and Natural England.

The cumulative impacts from anchored nets and lines and traps could potentially increase the risk of negative effects from the pressure abrasion and disturbance of the substrate on the surface of the seabed. However as discussed in **section 4.2**, VMS activity data shows there to be no known activity for vessels over 12 m using traps so there will be no in-combination pressure from this size class of vessel. Under 12 m vessel activity is common in the site from both anchored nets and lines and traps. Trap activity was the most frequent gear type used landing 64.67 t on average per year between 2016 and 2020. Landings from anchored nets and lines were on average 29.48 t. However as discussed throughout **section 4.3** the biotopes present within both the rocky reef feature and the subtidal sediment features have protection due to their subsurface/crevice dwelling habitat offering them safety from the abrasion pressure or, additionally, species present have high rates of reproduction or and a medium to high resilience, meaning they would recover swiftly after an abrasion event. Furthermore under 12 m vessel activity is apportioned to the MPA and it is recognised that activity may not be distributed evenly across the ICES rectangle. Foreland MPA only has a percentage overlap of 8.11 % with ICES rectangle 31F1, and as such landings estimates for vessels smaller than 12 m in length are expected to be an overestimate.

Both traps and anchored nets and lines activity have already been assessed independently as having no significant risk of hindering the conservation objectives and from the activity levels described and biotopes present **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 Foreland MPA at current levels.**

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 Foreland MPA are sensitive to physical damage through surface abrasion and disturbance of the substrate from anchored nets and lines and traps 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.

Activities associated with the GridLink Interconnector (MLA/2020/00262) which might cause abrasion or disturbance of the seabed relate to dredge and spoil disposal, the laying, burial and protection of power cable and the operation and maintenance of the power cable. The license was granted in 2022 and ends on 31st December 2071.

The planned route for the cable cuts through the top northeast area of Foreland MPA and as such there is the potential for in-combination effects from traps and anchored nets and lines fishing activity regarding the abrasion pressure.

As detailed in **section 4.3** abrasion and disturbance of seabed surface substrate, at current activity levels anchored nets and lines and traps are not considered to be causing significant pressure through abrasion and disturbance. It is possible that activities linked to the GridLink Interconnector, in-combination with anchored nets and lines and traps may increase the potential for this pressure to have negative cumulative effects on the subtidal sand, subtidal coarse sediment, high energy circalittoral rock and moderate energy circalittoral rock designated features of the MPA. However, the location of the development within the MPA only has potential to affect the subtidal sand and subtidal coarse sediment features of the site. Furthermore, during construction, the proposed development will have a footprint of less than 0.07 % of the total area of the MPA. Repeat disturbance is expected during the construction, however due to the hydrodynamic regime of the area it is anticipated that any areas of trench to be naturally infilled. As this will be a one-off event, the underlying character of the habitat is likely to remain similar and will be instantly available for re-establishment of biological communities. It is therefore unlikely that there will be a significant in-combination risk of hindering the conservation objectives. Therefore, the scale of the in-combination impacts from abrasion and disturbance of the substrate on the surface of the seabed between anchored nets and lines and traps and GridLink Interconnector (MLA/2020/00262) is considered insignificant.

Activities associated with the Crown Estate aggregates key resource area (KRA) survey: vibrocore sampling (MLA/2023/00222) which may cause abrasion or disturbance relate to the physical sampling of the seabed. The license end date is September 2024. Two of the sampling sites associated with this license are in the north of the site and as such there is the potential for in-combination effects from traps and anchored nets and lines fishing activity regarding the abrasion pressure.

Vibrocores will remove a total of 0.038m^3 at each sampling location, resulting in 0.076m^3 of sediment to be removed. The removal of 0.076m^3 of sediment from the MPA for testing is an insignificant amount and sediments will quickly infill and recover due to the hydrodynamic regime of the tides and currents in the area. These samples will be a one-off event and due to the insignificant sample size, in the context of the wider MPA, it is therefore unlikely that there will be a significant in-combination risk of hindering the achievement of the conservation objectives. Therefore, the scale of the in-combination impacts from abrasion and disturbance of the substrate on the surface of the seabed between anchored nets and lines and traps and vibrocore sampling (MLA/2023/00222) is considered insignificant.

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 Foreland 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 a significant risk of hindering the achievement of the conservation objectives for Foreland MPA.

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

6 Conclusion and proposed management

Part A - Identified pressures on the MPA of this assessment concluded that anchored nets and lines, bottom towed gear and traps, alone, are likely to have a significant effect on the designated features of Foreland MPA.

Part B - Fishing activity assessment of this assessment concluded that ongoing use of bottom towed gear on the sediment features of Foreland 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.

Part C - In-combination assessment 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, will not result in 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 Foreland 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[4] document.

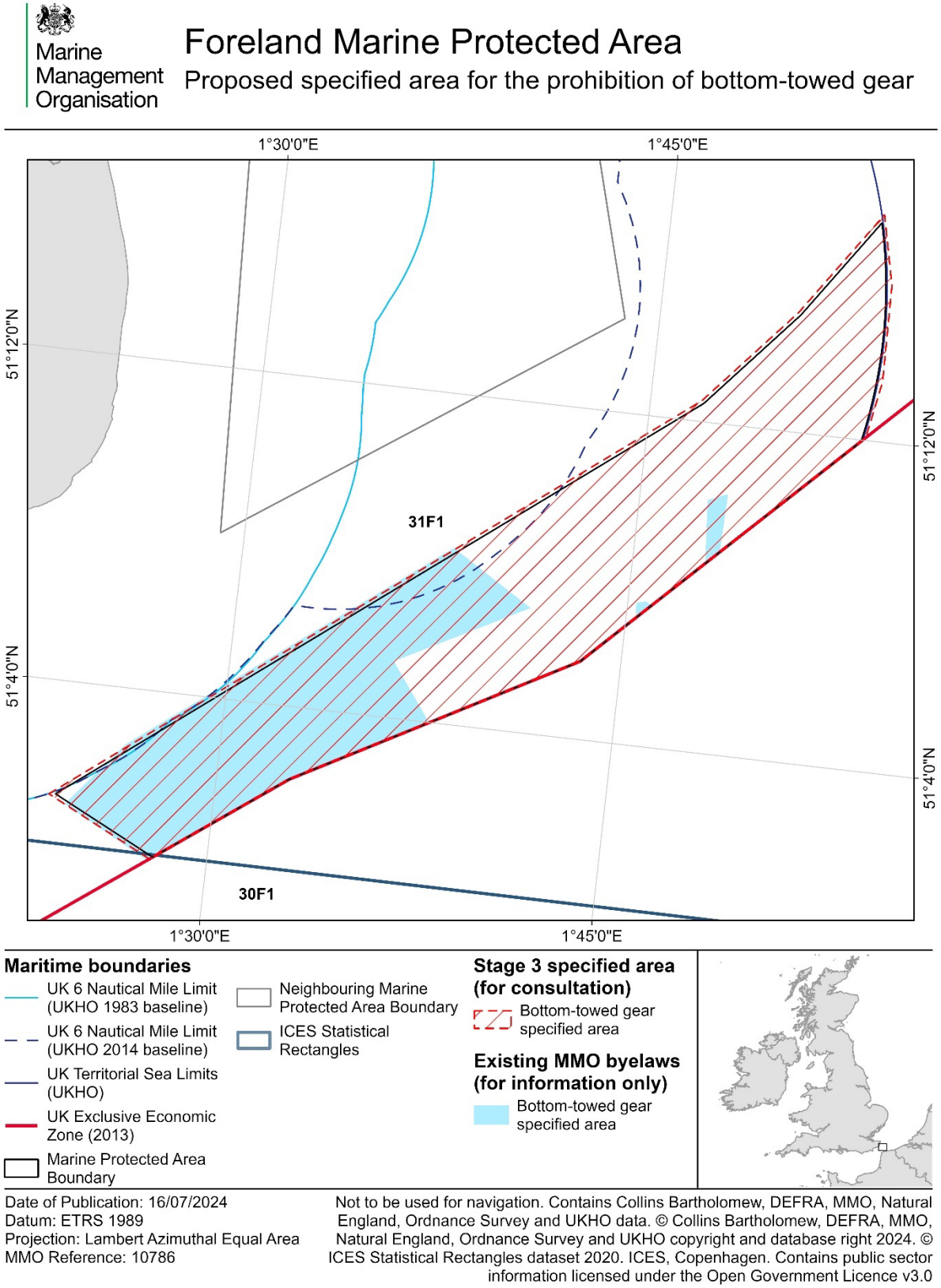

Figure 2: Map of proposed management.

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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Annex 1: Fishing activity data

Table A1. 1: VMS record count per nation group (UK and EU Member State (EU)) and proportional activity (%), per gear, per gear group, per year (2016 to 2021), totals and annual average (2016 to 2021). All numbers are rounded to the nearest whole number.

			2016		2017		2018		2019		2020		2021		Total (2016 to 2021)		Average (2016 to 2021)
Gear group	**Gear code**	**Nation group**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**	**%**	**Count**
Anchored net/line	**GNS**	EU	12	100	0	0	2	100	0	0	11	100	0	0	25	100	4
	GNS total		**12**	**3**	**0**	**0**	**2**	**0**	**0**	**0**	**11**	**3**	**0**	**0**	**25**	**1**	**4**
	GTN	EU	26	100	104	100	145	100	554	100	282	100	0	0	1,111	100	185
	GTN total		**26**	**7**	**104**	**23**	**145**	**35**	**554**	**90**	**282**	**86**	**0**	**0**	**1,111**	**51**	**185**
	GTR	EU	343	100	344	100	268	100	59	100	36	100	8	100	1,058	100	176
	GTR total		**343**	**90**	**344**	**77**	**268**	**65**	**59**	**10**	**36**	**11**	**8**	**100**	**1,058**	**48**	**176**
Anchored net/line total			**381**	**9**	**448**	**18**	**415**	**9**	**613**	**10**	**329**	**5**	**8**	**1**	**2,194**	**8**	**366**
Demersal seine	**SDN**	EU	94	100	307	100	988	100	1,853	100	2,169	100	154	100	5,565	100	928
	SDN	UK	0	0	0	0	0	0	1	0	5	0	0	0	6	0	1
	SDN total		**94**	**58**	**307**	**93**	**988**	**99**	**1,854**	**96**	**2,174**	**95**	**154**	**51**	**5,571**	**93**	**929**
	SPR	EU	3	100	5	100	1	100	3	100	3	100	0	0	15	100	3
	SPR total		**3**	**2**	**5**	**2**	**1**	**0**	**3**	**0**	**3**	**0**	**0**	**0**	**15**	**0**	**3**
	SSC	EU	5	8	4	22	4	44	44	62	68	57	60	41	185	43	31
	SSC	UK	60	92	14	78	5	56	27	38	51	43	87	59	244	57	41
	SSC total		**65**	**40**	**18**	**5**	**9**	**1**	**71**	**4**	**119**	**5**	**147**	**49**	**429**	**7**	**72**
	SX	EU	0	0	0	0	0	0	1	100	0	0	0	0	1	100	0
	SX Total		**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
Demersal seine total			**162**	**4**	**330**	**13**	**998**	**21**	**1,929**	**31**	**2,296**	**31**	**301**	**25**	**6,016**	**23**	**1,003**
Demersal trawl	**OT**	EU	0	0	0	0	0	0	0	0	9	100	0	0	9	100	2
	OT Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**9**	**0**	**2**

			2016		2017		2018		2019		2020		2021		Total (2016 to 2021)		Average (2016 to 2021)
Gear group	Gear code	Nation group	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count
	OTB	EU	3,512	100	1,498	100	2,569	99	2,709	99	2,889	90	724	88	1,3901	97	2,317
	OTB	UK	0	0	0	0	28	1	35	1	328	10	97	12	488	3	81
	OTB total		**3,512**	**99**	**1,498**	**95**	**2,597**	**89**	**2,744**	**82**	**3,217**	**71**	**821**	**95**	**1,4389**	**86**	**2,398**
	OTT	EU	0	0	0	0	0	0	0	0	91	100	15	100	106	100	18
	OTT total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**91**	**2**	**15**	**2**	**106**	**1**	**18**
	TBB	EU	38	100	80	100	336	100	594	100	1,183	100	26	90	2,257	100	376
	TBB	UK	0	0	0	0	0	0	0	0	3	0	3	10	6	0	1
	TBB total		**38**	**1**	**80**	**5**	**336**	**11**	**594**	**18**	**1186**	**26**	**29**	**3**	**2263**	**13**	**377**
Demersal trawl total			**3,550**	**86**	**1,578**	**64**	**2,933**	**62**	**3,338**	**53**	**4,503**	**62**	**865**	**71**	**16,767**	**64**	**2,795**
Dredge	DRB	EU	0	0	0	0	0	0	0	0	1	100	0	0	1	100	0
	DRB total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**100**	**0**	**0**	**1**	**100**	**0**
Dredge total			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**
Midwater trawl	OTM	EU	3	100	42	100	42	100	3	100	2	100	12	100	104	100	17
	OTM total		**3**	**7**	**42**	**42**	**42**	**11**	**3**	**1**	**2**	**1**	**12**	**31**	**104**	**10**	**17**
	PTM	EU	39	100	51	89	344	99	376	100	139	1	18	0	967	98	161
	PTM	UK	0	0	6	11	2	1	0	0	0	0	9	33	17	2	3
	PTM total		**39**	**93**	**57**	**58**	**346**	**89**	**376**	**99**	**139**	**99**	**27**	**69**	**984**	**90**	**164**
Midwater trawl total			**42**	**1**	**99**	**4**	**388**	**8**	**379**	**6**	**141**	**2**	**39**	**3**	**1,088**	**4**	**181**
Unknown	NK	EU	1	100	0	0	1	100	23	96	31	100	0	0	56	98	9
	NK	Faroe Islands	0	0	0	0	0	0	1	4	0	0	0	0	1	2	0
	NK total		**1**	**100**	**0**	**0**	**1**	**100**	**24**	**100**	**31**	**100**	**0**	**0**	**57**	**100**	**10**
Unknown total			**1**	**0**	**0**	**0**	**1**	**0**	**24**	**0**	**31**	**0**	**0**	**0**	**57**	**0**	**10**
Grand total			**4,136**	**6**	**2,455**	**3**	**4,735**	**7**	**6,283**	**9**	**7,301**	**11**	**1,213**	**2**	**26,123**	**6**	**4,355**

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

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Demersal seine	SDN	0	0	0	1.57	0.68	2.24	0.45
	SSC	46.35	21.93	4.5	41.68	41.62	156.07	31.21
Demersal seine total		**46.35**	**21.93**	**4.5**	**43.25**	**42.29**	**158.31**	**31.66**
Demersal trawl	OTB	0	0	11.89	16.79	66.42	95.09	19.02
	TBB	0	0	0	0	2.42	2.42	0.48
Demersal trawl total		**0**	**0**	**11.89**	**16.79**	**68.83**	**97.51**	**19.5**
Midwater trawl	PTM	0	176.29	36.21	0	0	212.5	42.5
Midwater trawl total		**0**	**176.29**	**36.21**	**0**	**0**	**212.5**	**42.5**
Grand total		**46.35**	**198.22**	**52.59**	**60.04**	**111.12**	**468.31**	**93.66**

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

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored net/line	GTR	0.31	0.48	0.43	0.05	0	1.27	0.25
Anchored net/line total		**0.31**	**0.48**	**0.43**	**0.05**	**0**	**1.27**	**0.25**
Demersal seine	SDN	28.63	45.84	74.90	94.99	68.39	312.74	62.55
	SPR	0	0	0	0	0.01	0.01	0
	SSC	9.24	5.00	6.11	37.51	42.37	100.24	20.05
Demersal seine total		**37.87**	**50.85**	**81.00**	**132.51**	**110.77**	**412.99**	**82.60**
Demersal trawl	OTB	325.36	150.89	326.88	441.66	377.08	1,621.87	324.37
	TBB	3.38	5.11	26.35	38.39	42.52	115.76	23.15
Demersal trawl total		**328.75**	**156.00**	**353.23**	**480.05**	**419.60**	**1,737.63**	**347.53**
Midwater trawl	OTM	30.20	163.24	112.90	28.42	56.82	391.58	78.32
	PTM	30.54	26.10	0	0	15.46	72.09	14.42
Midwater trawl total		**60.73**	**189.34**	**112.90**	**28.42**	**72.29**	**463.67**	**92.73**
Grand total		**427.66**	**396.67**	**547.56**	**641.03**	**602.66**	**2,615.57**	**523.11**

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

ICES rectangle	Percentage overlap (%)
31F1	8.11

Table A1. 5: UK live weight landings tonnage (t) estimates by gear from vessels under 12 m in length for the MMO section of Foreland MPA (2016 to 2020).

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored net/line	GN	11.29	9.22	12.33	8.24	6.47	47.56	9.51
	GNS	6.56	6.37	1.01	1.09	0.11	15.15	3.03
	GTR	3.72	2.94	2.44	3.05	2.49	14.65	2.93
	LL	0	0	0	0	0	0	0
Anchored net/line total		**21.58**	**18.54**	**15.78**	**12.39**	**9.07**	**77.36**	**15.47**
Demersal trawl	OT	12.16	4.35	0	0	0	16.51	3.30
	OTB	0.48	5.78	8.77	4.62	6.07	25.71	5.14
	OTT	0.07	0.02	0	0	0	0.09	0.02
	TBB	0.01	0.04	0	0	0	0.05	0.01
Demersal trawl total		**12.72**	**10.18**	**8.77**	**4.62**	**6.07**	**42.36**	**8.47**
Dredge	DRB	2.23	1.98	2.82	4.86	45.89	57.78	11.56
	HMD	0	0	0	0	0	0	0
Dredge total		**2.23**	**1.98**	**2.82**	**4.86**	**45.89**	**57.78**	**11.56**
Midwater gill drift	GND	1.05	0.07	0.01	0	1.60	2.74	0.55
Midwater gill drift total		**1.05**	**0.07**	**0.01**	**0**	**1.60**	**2.74**	**0.55**
Midwater hook/line	LHP	0	0	0	0	0.02	0.02	0
	LX	0	0.16	0.07	0.69	0.75	1.67	0.33
Midwater hook/line total		**0**	**0.16**	**0.07**	**0.69**	**0.77**	**1.69**	**0.34**
Midwater trawl	OTM	0	0.17	0	1.37	4.59	6.12	1.22
	PTM	0.71	0.13	0	0	0	0.84	0.17
Midwater trawl total		**0.71**	**0.30**	**0**	**1.37**	**4.59**	**6.96**	**1.39**
Traps	FIX	0.11	0.03	0	0	0	0.14	0.03
	FPO	71.62	56.62	28.72	44.54	68.52	270.02	54.00
Traps total		**71.73**	**56.65**	**28.72**	**44.54**	**68.52**	**270.16**	**54.03**
Grand total		**110.02**	**87.88**	**56.18**	**68.46**	**136.50**	**459.05**	**91.81**

Table A1. 6: EU27 live weight landings tonnage (t) estimates by gear from vessels under 12 m in length for the MMO section of Foreland MPA (2016 to 2020).

Gear group	Gear code	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Anchored net/line	GTR	7.90	5.79	5.20	4.55	1.83	25.26	5.05
	GNS	0	1.42	0.46	0.22	0.31	2.42	0.48
	GTN	0	0	0	0.01	0	0.01	0
Anchored net/line total		**7.90**	**7.21**	**5.66**	**4.78**	**2.14**	**27.69**	**5.54**
Demersal seine	SSC	0	0	0.36	0.06	0.24	0.66	0.13
Demersal seine total		**0**	**0**	**0.36**	**0.06**	**0.24**	**0.66**	**0.13**
Dredge	DRB	0.04	0	0	0	0	0.04	0.01
Dredge total		**0.04**	**0**	**0**	**0**	**0**	**0.04**	**0.01**
Midwater - hook/line	LHP	0.30	0.31	0.16	0.02	0.10	0.90	0.18
Midwater - hook/line	LTL	0	0.03	0.01	0	0	0.04	0.01
Midwater - hook/line total		**0.30**	**0.34**	**0.17**	**0.02**	**0.10**	**0.94**	**0.19**
Traps	FPO	2.15	1.56	6.09	24.31	19.11	53.22	10.64
Traps total		**2.15**	**1.56**	**6.09**	**24.31**	**19.11**	**53.22**	**10.64**
Grand total		**10.39**	**9.12**	**12.28**	**29.17**	**21.59**	**82.55**	**16.51**

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

Gear group	SAR category	2016	2017	2018	2019	2020
Demersal seines	Surface	3.56	3.66	3.30	6.53	8.52
	Subsurface	0.09	0.06	0.03	0.18	0.24
Dredges	Surface	0	0	0	0	0
	Subsurface	0	0	0	0	0
Demersal trawls	Surface	3.74	2.12	3.93	6.08	7.09
	Subsurface	0.53	0.33	0.62	0.96	0.99
Bottom towed gear total	**Surface**	**7.30**	**5.79**	**7.23**	**12.61**	**15.62**
	Subsurface	**0.63**	**0.39**	**0.66**	**1.14**	**1.23**

Table A1. 8: Fishing effort (days) recorded by UK vessels under 12 m in length, separated by gear type for the area of Foreland MPA that intersects ICES rectangles 31F1 (2016 to 2020). ICES rectangle level data has been apportioned to the MPA based on the percentage area of the ICES rectangle that intersects the MPA (see Table A1. 4).

Gear group	2016	2017	2018	2019	2020	Total (2016 to 2020)	Average (2016 to 2020)
Demersal trawl	3.49	2.27	0.65	4.06	3.41	13.87	2.77
Dredges	9.00	6.57	6.24	8.52	7.87	38.20	7.64
Bottom towed gear total	**12.49**	**8.84**	**6.89**	**12.57**	**11.27**	**52.07**	**10.41**
Midwater gill drift	9.33	0.65	0.08	0	0.32	10.38	2.08
Midwater - hooks/lines	0	0	0	0	0.24	0.24	0.05
Midwater trawl	1.54	0.65	0	0.97	1.46	4.62	0.92
Midwater gear total	**10.87**	**1.30**	**0.08**	**0.97**	**2.03**	**15.25**	**3.05**
Anchored nets and lines	129.60	100.65	84.91	71.21	55.80	442.16	88.43
Traps	146.87	118.89	66.50	72.91	95.37	500.55	100.11
Static gear total	**276.47**	**219.54**	**151.41**	**144.11**	**151.17**	**942.71**	**188.54**
Grand total	**299.83**	**229.68**	**158.38**	**157.65**	**164.47**	**1,010.03**	**202.01**