



Marine  
Management  
Organisation

# MMO De Minimis Assessment: Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023

August 2023



...ambitious for our seas and coasts

<b>De Minimis Assessment (DMA)</b>	
<b>Title of Measure</b>	Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023
<b>Lead Department/Agency</b>	Marine Management Organisation (MMO)
<b>Expected Date of Implementation</b>	
<b>Origin (Domestic or International)</b>	Domestic
<b>Date of Assessment</b>	31/08/2023
<b>Lead Departmental Contact</b>	Marine Conservation Team, Marine Management Organisation, Lancaster House, Hampshire Court, Newcastle, NE4 7YH. <a href="mailto:conservation@marinemanagement.org.uk">conservation@marinemanagement.org.uk</a>
<b>Departmental Triage Assessment</b>	Low-cost regulation (fast track)
<b>Viable policy options (including alternatives to regulation)</b>	
<ul style="list-style-type: none"> <li>• <b>Option 0:</b> Do nothing.</li> <li>• <b>Option 1:</b> No statutory restrictions. Introduce a voluntary agreement.</li> <li>• <b>Option 2:</b> Removal of pressures from specified areas of designated feature via prohibition of bottom towed fishing. This may include a whole site prohibition where sensitive designated features are distributed throughout the whole site.</li> <li>• <b>Option 3:</b> Removal of pressures via a whole site prohibition across all sites. The use of bottom towed gear will be prohibited throughout the MMO section of all sites considered in this assessment.</li> </ul> <p><b>Option 2</b> is the preferred option, as it will allow for the removal of pressures deemed incompatible with the conservation objectives of the site, whilst also allowing fishing activities to continue in areas of the site where designated features are not present.</p>	
<b>Description of novel and contentious elements (if any)</b>	
<ul style="list-style-type: none"> <li>• Management measures considered across multiple marine protected areas (MPAs) may be considered as novel, MMO have published information on its MPA management strategy and each of the stages<sup>1</sup>.</li> <li>• In utilising powers introduced by the Fisheries Act 2020<sup>2</sup>, MMO must have regard for UK-EU Trade and Cooperation Agreement<sup>3</sup>.</li> </ul>	
<b>Initial assessment of impacts on business</b>	
Available evidence suggests 328 UK fishing vessels are likely to be directly affected by the prohibition of bottom towed fishing gears within the management areas.	

<sup>1</sup> <https://www.gov.uk/government/collections/managing-fisheries-in-marine-protected-areas>

<sup>2</sup> <https://www.legislation.gov.uk/ukpga/2020/22/contents/enacted>

<sup>3</sup> [https://ec.europa.eu/info/strategy/reasons-non-eu-countries/reasons-united-kingdom/eu-uk-trade-and-cooperation-agreement\\_en](https://ec.europa.eu/info/strategy/reasons-non-eu-countries/reasons-united-kingdom/eu-uk-trade-and-cooperation-agreement_en) [ec.europa.eu/info/strategy/reasons-non-eu-countries/reasons-united-kingdom/eu-uk-trade-and-cooperation-agreement\\_en](https://ec.europa.eu/info/strategy/reasons-non-eu-countries/reasons-united-kingdom/eu-uk-trade-and-cooperation-agreement_en)

## De Minimis Assessment (DMA)

The impacts are likely to be ongoing as opposed to one-off but are expected to be mitigated by use of other available fishing grounds.

The estimated monetised total cost to UK businesses over ten years is expected to be £319,880 (2020 present value). The equivalent annual net direct cost to business (EANDCB) is £37,162 (2020 present value). This figures do not account for possible recouping of some value by fishers through displacement (ie fishing alternative grounds). Non-monetised costs include the potential impact of displaced fishing activity on habitats/areas outside of the management areas, and indirect costs to the fishing industry associated with displacement to other fishing grounds.

Although displacement resulting from the introduction of management measures put in place may result in higher levels of fishing pressure on areas outside of MPAs, the location (and thus the associated environmental costs) of displaced fishing activity is unclear.

None of the expected benefits of the management measure have been monetised. This is due to capacity and time constraints. Non-monetised benefits include the fulfilment of MMO's duties under the Marine and Coastal Access Act 2009<sup>4</sup>, The Conservation of Habitats and Species Regulations 2017<sup>5</sup> and The Conservation of Offshore Marine Habitats and Species Regulations 2017<sup>6</sup> through the protection of designated features. Non-monetised benefits will also include the ecosystem services the designated features provide, including indirect benefits to the fishing industry resulting from spillover.

### Summary of monetised impacts

- Estimated Net Present Value: -£326,413
- Estimated Business Net Present value: -£326,413
- Estimated Equivalent Annualised Net Direct Costs to Business: £37,921
- Appraisal period: ten years
- The Price Base Year and Present Value Base Year: 2019 and 2020
- **BIT status/score: 189605.7**

The proposal is a Regulatory Provision as it relates to business activity (commercial fishing); it has a regulatory effect by prohibiting the use of bottom towed fishing gears within specified areas; and has effect by virtue of the exercise of a function conferred on a Minister of the Crown or a relevant regulator.

The proposal is a Qualifying Regulatory Provision as it does not fall within any of the administrative exclusions set out in the Business Impact Target written ministerial statement - HCWS574<sup>7</sup>.

<sup>4</sup> [www.legislation.gov.uk/ukpga/2009/23/contents](http://www.legislation.gov.uk/ukpga/2009/23/contents)

<sup>5</sup> [www.legislation.gov.uk/uksi/2017/1012/contents/made](http://www.legislation.gov.uk/uksi/2017/1012/contents/made)

<sup>6</sup> [www.legislation.gov.uk/uksi/2017/1013/contents/made](http://www.legislation.gov.uk/uksi/2017/1013/contents/made)

<sup>7</sup> <https://questions-statements.parliament.uk/written-statements/detail/2016-03-03/HCWS574>

## De Minimis Assessment (DMA)

### **Rationale for producing a DMA (as opposed to a Regulatory Impact Assessment)**

The fast-track appraisal route is appropriate as this regulation falls under the 'low cost' criteria - EANDCB is under £5m, as detailed in the initial assessment of impact on business above.

# Marine Management Organisation (MMO) De Minimis Assessment: Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023

## Contents

<b>1</b>	<b>Supporting evidence.....</b>	<b>5</b>
1.1	Policy issue and rationale for Government intervention .....	5
1.2	Rationale for intervention and intended effects .....	7
1.3	Marine Plan Assessment .....	8
1.4	Marine Strategy Regulations .....	11
<b>2</b>	<b>Policy objectives and intended effects .....</b>	<b>12</b>
<b>3</b>	<b>Policy options considered, including alternatives to regulation .....</b>	<b>14</b>
<b>4</b>	<b>Expected level of business impact.....</b>	<b>15</b>
4.1	VMS maps.....	17
4.2	Costs to the UK fishing industry .....	17
4.3	Familiarisation costs.....	23
4.4	Monitoring and compliance .....	23
4.5	Total monetised costs .....	24
4.6	Non-monetised costs .....	26
4.7	Non-monetised benefits .....	27
<b>5</b>	<b>Recommended management options .....</b>	<b>29</b>
<b>6</b>	<b>References .....</b>	<b>30</b>
<b>7</b>	<b>Annex: Tables and figures .....</b>	<b>32</b>

# 1 Supporting evidence

## 1.1 Policy issue and rationale for Government intervention

MMO has duties to further the conservation objectives of marine protected areas (MPAs)<sup>8</sup>. MMO also has powers to manage fishing in order to conserve marine flora, fauna and habitats<sup>9</sup>.

MMO is implementing necessary management in offshore MPAs in a number of stages. As part of Stage 2 of this work, MMO has undertaken an assessment<sup>10</sup> of the impact of bottom towed fishing in 13 MPAs. This assessment determined that bottom towed fishing gear may not be compatible with the conservation objectives of the MPAs. The byelaw will further the conservation objectives of the MPAs by conserving marine fauna and habitats by prohibiting the use of bottom towed fishing gear within specified areas of the sites.

Table 1 lists the MPAs that have been included in the Stage 2 Assessment and the designated features that the byelaw is intended to protect. Figure 1 displays the location of those MPAs in the English marine area.

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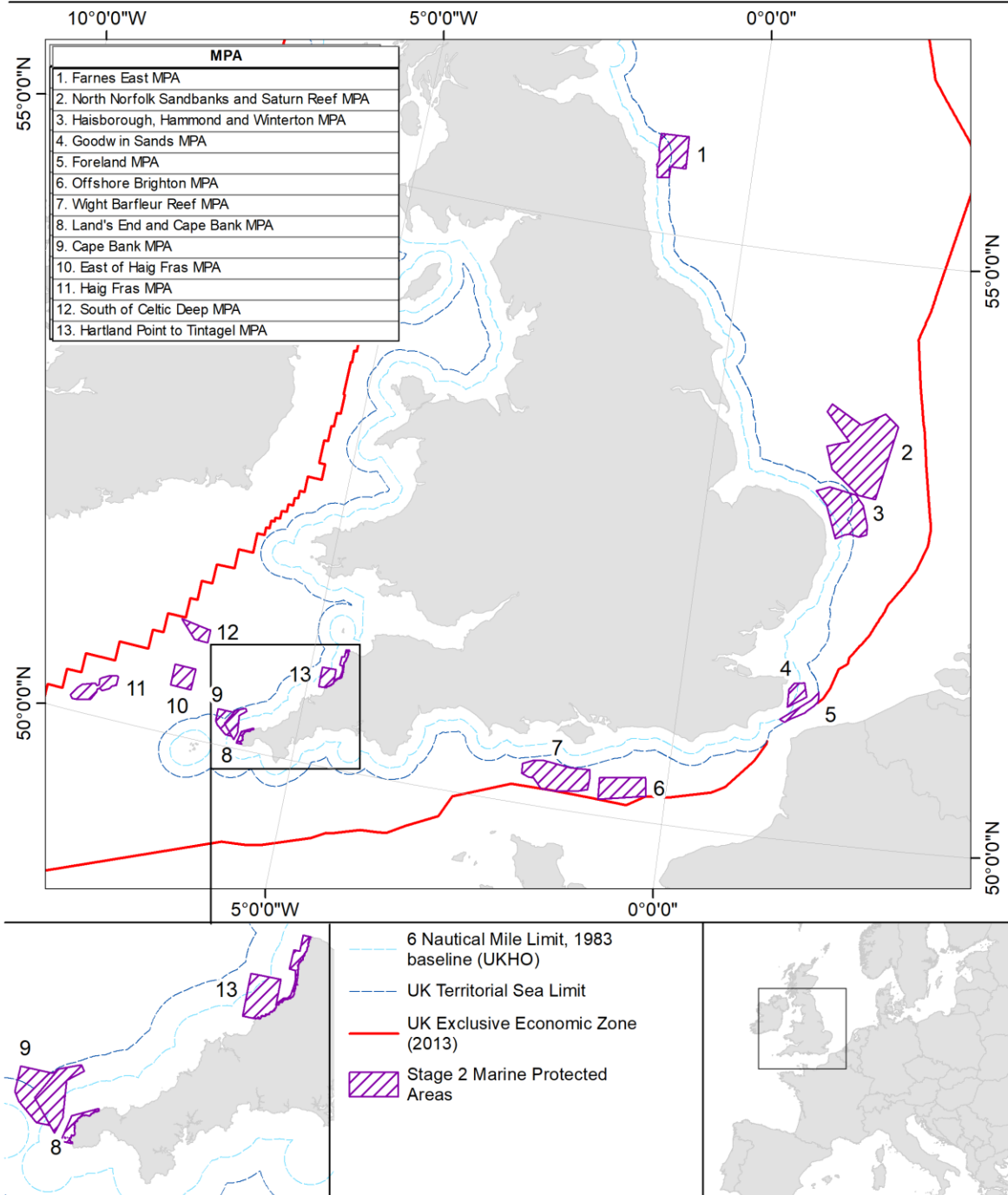
<sup>8</sup> Section 125 of the Marine and Coastal Access Act 2009, Regulation 9 of the Conservation of Habitats and Species Regulations 2017 and regulation 6 of the Conservation of Offshore Marine Habitats and Species Regulations 2017

<sup>9</sup> Sections 129A and 129B of the Marine and Coastal Access Act 2009.

<sup>10</sup> [www.gov.uk/government/publications/managing-fisheries-in-marine-protection-areas-call-for-evidence](http://www.gov.uk/government/publications/managing-fisheries-in-marine-protection-areas-call-for-evidence)



# Stage 2 Marine Protected Areas



Date of Publication: 12/10/2022  
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 Projection: Lambert Azimuthal Equal Area  
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**Figure 1. MPAs included in Stage 2.**

**Table 1. MPAs considered in Stage 2 and designated features protected by the byelaw.**

MPA	Designated Features
Cape Bank	Moderate energy circalittoral rock
East of Haig Fras	High energy circalittoral rock
	Moderate energy circalittoral rock
Farnes East	Moderate energy circalittoral rock
Foreland	High energy circalittoral rock
	Moderate energy circalittoral rock
Goodwin Sands	Moderate energy circalittoral rock
	Ross worm ( <i>Sabellaria spinulosa</i> ) reefs
Haig Fras	Rocky reef
Haisborough, Hammond and Winterton	Biogenic reef ( <i>Sabellaria spp.</i> )
Hartland Point to Tintagel	High energy circalittoral rock
	Moderate energy circalittoral rock
	Fragile sponge and anthozoan communities on subtidal rocky habitats
	Pink sea-fan ( <i>Eunicella verrucosa</i> )
Land's End and Cape Bank	Rocky reef
North Norfolk Sandbanks and Saturn Reef	Biogenic reef ( <i>Sabellaria spp.</i> )
Offshore Brighton	High energy circalittoral rock
South of Celtic Deep	Moderate energy circalittoral rock
Wight-Barfleur Reef	Rocky reef

## 1.2 Rationale for intervention and intended effects

Fishing activity has the potential to hinder the conservation objectives of MPAs.

The MMO Stage 2 MPA Fisheries Assessment has concluded that bottom towed fishing activities are not compatible with the conservation objectives of the Stage 2 sites. The byelaw is intended to ensure conservation objectives of the Stage 2 sites are furthered, conserving marine fauna and habitats by prohibiting bottom towed fishing activities within specified areas.

Fishing activities have the potential to cause negative outcomes in the marine environment as a result of 'market failures'. These failures can be described as:

- Public goods and services: A number of goods and services provided by the marine environment, such as biological diversity, are 'public goods' (no-one can be excluded from benefiting from them, but use of the goods does not diminish the goods being available to others). These characteristics of public



goods, mean that individuals do not necessarily have an incentive to voluntarily ensure the continued existence of these goods which can lead to over-exploitation. With regard to bottom towed fishing, this means that fishers can benefit from the biological diversity of marine habitats through sale of sea fisheries resources caught while simultaneously damaging the habitat and reducing its biological diversity. While the habitat continues to provide benefits to fishers through the sales of sea fisheries resources, there is no incentive to protect these habitats. A lack of ownership allows the activity to continue unchecked until such time biological diversity falls to the point where catches are no longer profitable, and fishers move on to more productive grounds. Fish stocks naturally replenish over time, however if over-exploitation occurs stocks would not be given a chance to replenish and could lead to a permanently diminished fish stock.

- **Negative externalities:** These occur when the cost of damage to the marine environment is not fully borne by the users causing the damage. Bottom towed fishing can cause severe damage to fragile habitats which can reduce biodiversity and productivity and take many years to recover. The only cost borne by bottom towed gear fishers of this damage is the eventual reduction in catches and the potential increase in fuel costs involved in moving to new fishing grounds. The availability of other fishing grounds lessens the cost associated with reduced catches, and potentially increased fuel costs are not significant enough to dissuade fishers from causing the damage in the first place.

The byelaw aims to redress these sources of market failure in the marine environment through conservation of designated features of MPAs, which will ensure negative externalities are reduced or suitably mitigated.

### 1.3 Marine Plan Assessment

The marine plan assessment is detailed below for each Stage 2 MPA according to the Marine Plan Area.

#### **MMO East Plan Area**

Haisborough, Hammond and Winterton MPA and North Norfolk Sandbanks and Saturn Reef MPA lie within the East Marine Plan Area. The East Marine Plan<sup>11</sup> was adopted in 2014. The decision to propose management for these sites has been made in accordance with the East Marine Plan. In particular, the following marine plan policies in the East Marine Plan are relevant:

- Biodiversity
  - [E-BIO-1](#)

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<sup>11</sup> [www.gov.uk/government/publications/east-inshore-and-east-offshore-marine-plans](http://www.gov.uk/government/publications/east-inshore-and-east-offshore-marine-plans)

- Economic productivity
  - [E-EC-1](#), [E-EC-2](#)
- Fishing
  - [E-FISH-1](#)
- Co-existence
  - [E-GOV-2](#), [E-GOV-3](#)
- Marine Protected Area Network
  - [E-MPA-1](#)
- Tourism and recreation
  - [E-TR-1](#), [E-TR-3](#)
- Social and cultural
  - [E-SOC-1](#)

The remaining policies in the East Marine Plan are not applicable.

### **MMO South West Plan Area**

Cape Bank MPA, East of Haig Fras MPA, Haig Fras MPA, Hartland Point to Tintagel MPA, Land's End and Cape Bank MPA and South of Celtic Deep MPA lie within the South West Marine Plan Area. The South West Marine Plan<sup>12</sup> was adopted in 2021. The decision to propose management for these sites has been made in accordance with the South West Marine Plan. In particular, the following marine plan policies in the South West Marine Plan are relevant:

- Biodiversity
  - [SW-BIO-1](#), [SW-BIO-2](#), [SW-BIO-3](#), [SW-HAB-1](#)
- Cumulative effects
  - [SW-CE-1](#)
- Co-existence
  - [SW-CO-1](#)
- Employment
  - [SW-EMP-1](#)
- Fishing
  - [SW-FISH-1](#), [SW-FISH-2](#), [SW-FISH-3](#)
- Marine Protected Area Network
  - [SW-MPA-1](#), [SW-MPA-2](#), [SW-MPA-4](#), [SW-HAB-1](#)
- Tourism and Recreation
  - [SW-TR-1](#)

The remaining policies in the South West Marine Plan are not applicable.

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<sup>12</sup> [www.gov.uk/government/publications/the-south-west-marine-plans-documents](http://www.gov.uk/government/publications/the-south-west-marine-plans-documents)

## MMO North East Plan Area

Farnes East MPA lies within the North East Marine Plan Area. The North East Marine Plan<sup>13</sup> was adopted in 2021. The decision to propose management for these sites has been made in accordance with the North East Marine Plan. In particular, the following marine plan policies in the North East Marine Plan are relevant:

- Biodiversity
  - [NE-BIO-1](#), [NE-BIO-2](#), [NE-BIO-3](#)
- Cumulative Effects
  - [NE-CE-1](#)
- Co-existence
  - [NE-CO-1](#)
- Employment
  - [NE-EMP-1](#)
- Fishing
  - [NE-FISH-1](#), [NE-FISH-2](#), [NE-FISH-3](#)
- Marine Protected Area Network
  - [NE-MPA-1](#), [NE-MPA-2](#)
- Tourism and Recreation
  - [NE-TR-1](#)

The remaining policies in the North East Marine Plan are not applicable.

## MMO South Plan Area

Foreland MPA, Wight-Barfleur Reef MPA and Offshore Brighton MPA lie within the South Marine Plan Area. The South Marine Plan<sup>14</sup> was adopted in 2018. The decision to propose management for these sites has been made in accordance with the South Marine Plan. In particular, the following marine plan policies in the South Marine Plan are relevant:

- Biodiversity
  - [S-BIO-1](#), [S-BIO-2](#), [S-BIO-3](#)
- Co-existence
  - [S-CO-1](#)
- Employment
  - [S-EMP-2](#)
- Fishing
  - [S-FISH-1](#), [S-FISH-2](#), [S-FISH-3](#), [S-FISH-4](#), [S-FISH-4-HER](#)
- Marine Protected Area Network
  - [S-MPA-1](#), [S-MPA-2](#), [S-MPA-4](#)

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<sup>13</sup> [www.gov.uk/government/publications/the-north-east-marine-plans-documents](http://www.gov.uk/government/publications/the-north-east-marine-plans-documents)

<sup>14</sup> [www.gov.uk/government/publications/the-south-marine-plans-documents](http://www.gov.uk/government/publications/the-south-marine-plans-documents)

- Social and Cultural
  - [S-SOC-1](#)
- Tourism and Recreation
  - [S-TR-1](#), [S-TR-2](#)

The remaining policies in the South Marine Plan are not applicable.

### **MMO South East Plan Area**

Foreland MPA and Goodwin Sands MPA lie within the South East Marine Plan Area. The South East Marine Plan<sup>15</sup> was adopted in 2021. The decision to propose management for these sites has been made in accordance with the South East Marine Plan. In particular, the following marine plan policies in the South East Marine Plan are relevant:

- Cumulative Effects
  - [SE-CE-1](#)
- Co-existence
  - [SE-CO-1](#)
- Biodiversity
  - [SE-BIO-1](#), [SE-BIO-2](#), [SE-BIO-3](#)
- Employment
  - [SE-EMP-1](#)
- Fishing
  - [SE-FISH-1](#), [SE-FISH-2](#), [SE-FISH-3](#)
- Marine Protected Area Network
  - [SE-MPA-1](#), [SE-MPA-2](#), [SE-MPA-4](#)
- Tourism and Recreation
  - [SE-TR-1](#)

The remaining policies in the South East Marine Plan are not applicable.

## **1.4 Marine Strategy Regulations**

In proposing the management options for the Stage 2 sites, MMO has considered the UK Marine Strategy, as required by regulation 9 of the Marine Strategy Regulations 2010<sup>16</sup>.

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<sup>15</sup> [www.gov.uk/government/publications/the-south-east-marine-plan-documents](http://www.gov.uk/government/publications/the-south-east-marine-plan-documents)

<sup>16</sup> [www.legislation.gov.uk/uksi/2010/1627/regulation/9/made](http://www.legislation.gov.uk/uksi/2010/1627/regulation/9/made)

## 2 Policy objectives and intended effects

The policy objective of the byelaw is to further the conservation objectives of the Stage 2 sites. This will be achieved by prohibiting certain fishing gears within specified areas of the sites.

The social and economic impacts of management intervention will be minimised where possible.

The byelaw also amends the MMO Lands End and Cape Bank European Marine Site (Specified Areas) Bottom Towed Gear Byelaw<sup>17</sup> ('the existing MMO byelaw'). Part of the spatial restriction within this byelaw sits inside the Cornwall Inshore Fisheries and Conservation District. When the Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023 comes into force it will cover the entirety of the Cape Bank MPA (and the Cape Bank section of the Land's End and Cape Bank MPA) outside of 6 nautical miles (nm). Cornwall IFCA have agreed to expand the spatial coverage of their Closed Areas (European Marine Sites) No. 2 Byelaw<sup>18</sup> to include the area inshore of 6 nm covered by the existing MMO byelaw.

In order to ensure continued protection for the area of Land's End and Cape Bank MPA within 6 nm, MMO will first amend the existing MMO byelaw via provisions within the byelaw so that it applies only inshore of 6 nm. When the revised Cornwall IFCA byelaw is ready to come into force, MMO will introduce a further byelaw to revoke the MMO Lands End and Cape Bank European Marine Site (Specified Areas) Bottom Towed Gear Byelaw entirely.

MMO will coordinate with Cornwall IFCA and Defra to ensure that the revocation of the existing MMO byelaw and the coming into force of the Cornwall IFCA byelaw occur simultaneously, avoiding any gap in protection for the area.

The byelaw also amends three existing byelaws:

- 'The Start Point To Plymouth Sound and Eddystone European Marine Site (Specified Areas) Bottom Towed Fishing Gear Byelaw' made by the Marine Management Organisation on 11 December 2013<sup>19</sup>;

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<sup>17</sup> [www.gov.uk/government/publications/lands-end-and-cape-bank-european-marine-site-specified-areas-bottom-towed-gear-byelaw](https://www.gov.uk/government/publications/lands-end-and-cape-bank-european-marine-site-specified-areas-bottom-towed-gear-byelaw)

<sup>18</sup>

[https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Byelaws%20and%20orders/Cornwall\\_SFC/Closed-Areas-EMS-byelaw-No-2.pdf](https://secure.toolkitfiles.co.uk/clients/17099/sitedata/Byelaws%20and%20orders/Cornwall_SFC/Closed-Areas-EMS-byelaw-No-2.pdf)

<sup>19</sup> <https://www.gov.uk/government/publications/start-point-to-plymouth-sound-and-eddy-stone-european-marine-site-specified-areas-bottom-towed-gear-byelaw>

- ‘The Margate and Long Sands European Marine Site (Specified Areas) Bottom Towed Fishing Gear Byelaw 2017’ made by the Marine Management Organisation on 2 August 2017<sup>20</sup>; and
- ‘The West of Walney Marine Conservation Zone (Specified Area) Bottom Towed Fishing Gear Byelaw 2018’ made by the Marine Management Organisation on 4 September 2018<sup>21</sup>.

These byelaws are amended by the byelaw in order to insert the requirement to have bottom towed fishing gear inboard, lashed and stowed when transiting specified areas (where use of those gears are prohibited) as defined within those byelaws.

The byelaw also revokes the following byelaw:

- ‘The Haisborough, Hammond and Winterton European Marine Site (Specified Areas) Bottom Towed Fishing Gear Byelaw’ made by the Marine Management Organisation on 11 December 2013<sup>22</sup>.

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<sup>20</sup> <https://www.gov.uk/government/publications/the-margate-and-long-sands-european-marine-site-specified-areas-bottom-towed-fishing-gear-byelaw>

<sup>21</sup> <https://www.gov.uk/government/publications/west-of-walney-marine-conservation-zone-specified-area-bottom-towed-fishing-gear-byelaw>

<sup>22</sup> <https://www.gov.uk/government/publications/haisborough-hammond-and-winterton-european-marine-site-specified-areas-bottom-towed-fishing-gear-byelaw>

### 3 Policy options considered, including alternatives to regulation

#### **Option 0: Do nothing.**

This option is not a viable option to conserve the marine habitats and further the conservation objectives of the sites. All other options are compared to option 0.

#### **Option 1: No statutory restrictions. Introduce a voluntary agreement.**

This option would involve the development of voluntary codes of practice to protect features. MMO has considered this option in light of Better Regulation, which requires that new regulation is introduced only as a last resort. However, the government's expectation is that management measures for commercial fishing in MPAs should be implemented through statutory regulation to ensure adequate protection is achieved<sup>23</sup>. Introduction of a voluntary measure would not provide assurance that sufficient protection would be achieved.

#### **Option 2: Removal of pressures from specified management areas of designated feature via prohibition of bottom towed fishing. This may include a whole site prohibition where sensitive designated features are distributed throughout the whole site (preferred option).**

Prohibiting the use of bottom towed gear within specified management areas of the sites containing the rock and reef features will protect these features from the impacts of bottom towed fishing activities. This option will conserve the sites' marine habitats and fauna and further the conservation objectives of the MPAs, whilst allowing bottom towed fishing activities to take place in other areas of the sites, where such features are not present. All other interactions between fishing and the designated features of these sites will be assessed and managed as part of Stage 3 of the MMO's work to manage fishing in offshore MPAs.

#### **Option 3: Removal of pressures via a whole site prohibition across all sites. The use of bottom towed gear will be prohibited throughout the MMO section of all sites considered in this assessment.**

This option would remove the impact of bottom towed fishing activities from all areas of all the sites. This will help to achieve the conservation objectives of the sites and give the best possible chance of restoring the features to favourable condition. However, it would also prohibit bottom towed fishing activity in areas of the sites

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<sup>23</sup> <https://www.gov.uk/government/publications/reviced-approach-to-the-management-of-commercial-fisheries-in-european-marine-sites-overarching-policy-and-delivery>

where rock and reef features do not occur. Interactions between bottom towed fishing gear and other designated features will be assessed and appropriate management implemented at a later stage.

**Option 2 is the preferred option. As such, this is reflected in the costs and benefits analysis.**

This is the chosen option as it will ensure protection for the rock and reef features from the impacts of bottom towed fishing activities, whilst also providing proportionality of impacts to industry by allowing activity to continue where rock and reef features are not present.

The boundaries of the management areas include buffer zones. This is to prevent direct damaging physical interactions between fishing activity adjacent to sensitive features and the designated features. Where the sensitive site features exist up to the boundary of the MPA, the buffer zone extends beyond the boundary of the MPA within English waters or to the Economic Exclusion Zone boundary. The buffer distance is based on generalised warp length to water depth ratios, thereby taking into account the water depth at the site and the possible location of mobile gear on the seabed relative to a vessel at the sea surface. The management boundary has also been simplified to aid compliance. The buffer zone therefore has been calculated based on the maximum depth of the site following Natural England and Joint Nature Conservation Committee guidance as detailed in Table 2.

**Table 2. Gear warp length: water depth ratio and buffer zone.**

Water depth	Ratio warp length: depth	Buffer
Shallow waters ( $\leq 25$ m)	4:1	4 x actual depth
Continental shelf (25 to 200 m)	3:1	3 x actual depth
Deep waters (200 to over 1000 m)	2:1	2 x actual depth

The methodology described above has been used to calculate the minimum buffer extent for spatial prohibitions within the Stage 2 MPAs. In some cases the spatial extent of the buffer will extend beyond the minimum calculated for simplicity and in order to facilitate effective enforcement of the management measures.

## 4 Expected level of business impact

All costs analysed are compared to Option 0. As reflected above, Option 2 is the chosen option, therefore MMO has used this as the basis for comparison.

MMO has used the best available evidence to assess the impact of the preferred management, however low risk assumptions have been made in the development of



this assessment, which are unlikely to impact upon final estimations of business impact:

- Vessel monitoring system (VMS) data assumes fishing activity from speed of travel. Speeds of up to six knots are considered fishing speed. Some vessels can tow bottom towed fishing gear at speeds greater than six knots which may lead to an underestimate of fishing activity. Some vessels may be travelling at speeds lower than six knots for reasons other than fishing (currents, tides etc.), this may lead to an overestimate of fishing activity.
- Economic performance indicators are estimated using the landings obtained from the MPA and individual vessels average Seafish calculated gross value added/profit ratios of fishing in the site. The economic performance indicators calculated per MPA are determined by the share of the value of landings derived by vessels fishing in the MPA versus overall value of their landings. It should be noted however that these estimates work on the assumption that the costs of vessels are distributed the same way as earnings between all individual vessel's fishing grounds. Seafish produces the dataset by combining costs and earnings information from vessel accounts provided by vessel owners to the annual Seafish UK Fleet Survey with official effort, landings and capacity data for all active UK fishing vessels provided by MMO.
- The estimate of economic impact to and number of under 12 m vessels impacted given are likely to be an overestimate, as landings provided for non-VMS vessels are provided at International Council for the Exploration of the Seas (ICES) rectangle level. MMO has therefore presented landings for all under 12 m vessels as a proportion based on the percentage of a given ICES rectangle intersected by a management area.
- Displacement is difficult to quantify, and it is impossible to predict where exactly activities may be displaced to.
- Estimated costs to the fishing industry are likely to be an overestimate, as vessels are likely to offset some of the lost revenue by fishing in other areas.
- It is possible that the improved environmental status within the management areas could coincide with relatively more abundant fishing grounds beyond the management areas (due to spillover), and therefore the analysis may have underestimated the value of reduced fishing ground.

Information used to assess the impacts of the closure has been taken from:

- VMS data for UK and non-UK vessels from 2016 to 2019, and 2021 taken from entered log book and sales note data provided by MMO statistics;
- landings data for UK vessels under and over 12 m in length;
- non-UK landings data for vessels under and over 12 m in length;

- data from Seafish annual economic performance for the UK fishing fleet from 2016 to 2019<sup>24</sup> and
- local MMO marine officer knowledge.

Prohibition of the use of bottom towed fishing gears in the management areas may result in the following costs:

- direct costs to the fishing industry from reduced access to fishing grounds;
- indirect costs to the fishing industry associated with displacement to other fishing grounds; and
- environmental impacts related to possible increased damage to habitats in other areas due to displacement.

Costs to the fishing industry have been monetised and these estimated values have been collated and presented as part of this DMA (Table 6, Table 7 and Table 8).

Environmental costs due to possible increased damage to habitats outside of the management areas due to displacement of fishing activity from the management areas to other areas are difficult to value, as it is unclear such activity will be displaced to and are therefore described here as non-monetised costs.

Prohibition of the use of bottom towed fishing gears in the management areas may result in indirect benefits to the fishing industry resulting from spillover and other environmental benefits related to the restoration of the habitat. These benefits are difficult to value and are therefore described under non-monetised benefits.

#### 4.1 VMS maps

A WebApp displaying VMS activity for vessels using bottom towed fishing gear around the 13 MPAs considered in this assessment has been produced. [Access the WebApp here.](#)

#### 4.2 Costs to the UK fishing industry

This DMA considers the economic impact to UK businesses. Economic impacts to non-UK businesses and individuals, including fishing vessels registered outside of the UK, are not in scope for the headline cost figures. However, evidence for non-UK fishing vessels has been provided for context.

Fisheries landings are reported at ICES statistical rectangle level. ICES standardise the division of sea areas for statistical analysis. Each ICES statistical rectangle is '30 min latitude by one degree longitude' in size which is approximately 30 nm by 30 nm (size varies with latitude due to the spheroid shape of the Earth).

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<sup>24</sup> <https://public.tableau.com/profile/seafish#!/vizhome/FleetEnquiryTool/1Overview>

To estimate the economic impacts of the management, fishing patterns of vessels using bottom towed gear within the management areas were analysed. The most recent five years of relevant VMS data and landings available (2016 – 2019, 2021) was used for this analysis. Landings and operating profit figures for 2020 are presented for context but not included when calculating annual averages due to the impacts of COVID-19.

VMS records for UK vessel fishing activity that has occurred in each of the management areas from 2016 to 2021 are displayed in Table 3. VMS records for non-UK vessels are displayed in Table 4.

**Table 3. Estimated number of UK vessels using bottom towed fishing gears within management areas from 2016 – 2021.**

Year	Under 12m*	Over 12m	Total
2016	123	25	148
2017	133	35	168
2018	90	22	112
2019	91	48	139
2020	76	30	105
2021	83	29	112
<b>Total (2016 – 2019, 2021)</b>	<b>235</b>	<b>93</b>	<b>328</b>

\*Figures represent all <12 m vessels with recorded landings within the ICES rectangles in which the management areas fall and therefore likely to be an over-estimate.

**Table 4. Number of non-UK vessels with bottom towed gear VMS fishing reports within management areas from 2016 – 2021. Figures only include vessels larger than 12 m in length. No data is available concerning the number of vessels less than 12 m in length fishing within management areas, but as discussed previously it is expected to be minimal.**

Country	2016	2017	2018	2019	2020	2021	Total 2016 – 2019, 2021
Belgium	20	19	24	30	30	25	47
Germany	1	2	0	1	2	0	2
Denmark	0	1	1	1	0	0	1
France	118	106	90	91	95	83	172
Spain	0	0	0	0	0	2	2
Ireland	16	16	20	30	18	10	50
Netherlands	22	22	26	20	17	20	48

Portugal	0	1	0	0	0	0	1
<b>Total</b>	<b>177</b>	<b>167</b>	<b>161</b>	<b>173</b>	<b>161</b>	<b>142</b>	<b>321</b>

Analysis has been performed on VMS records from within each of the MPAs considered in this impact assessment.

Fishing activity in Cape Bank MPA mainly consists of demersal trawls, particularly bottom otter trawls, however some limited dredging activity has been known to occur. The majority of bottom towed gear activity (94%) is conducted by non-UK, particularly French, vessels. However, UK, Belgian and Irish vessels are also active in the site.

Fishing activity in Farnes East MPA is almost exclusively by UK vessels (99%). The little non-UK fishing activity that occurs is from Dutch twin otter trawlers. The majority of UK activity within the site is dredging. The remainder of the UK activity within the site consists of demersal otter trawling.

Fishing activity in Foreland MPA is almost exclusively by non-UK vessels (99%). This is mainly from bottom otter trawling, however demersal seining (particularly 'Danish' or 'anchor' seines) and beam trawling also occur. The small amount of UK bottom towed gear activity that does occur is via otter trawling and seining.

Fishing activity in Goodwin Sands MPA is split between UK (50%) and non-UK (50%) vessels. The majority of non-UK fishing activity within the site consists of bottom otter trawls (61%), and, to a lesser extent, demersal seines (11% Danish or anchor seines, 2% Scottish seines) and beam trawls (8 %). Bottom towed gears used by UK vessels with VMS within the site include Danish or anchor seines, Scottish seines, and bottom otter trawls.

Fishing activity in Haig Fras MPA is almost exclusively by non-UK vessels (99%) particularly from France and Ireland. Bottom otter trawls are most prevalent, however some limited seining, including Danish or anchor and pair seining, also occur.

Fishing activity in Haisborough, Hammond and Winterton MPA is conducted almost exclusively (99.6%) by non-UK vessels. Dutch beam trawlers are most prevalent, however there has also been limited use of otter trawls by German, French and Belgian vessels and beam trawls by German and Belgian vessels.

Fishing activity in Hartland Point to Tintagel MPA is limited, with no VMS reports recorded 2016 - 2019. However, reviewing sightings data and expert opinion, low intensity demersal trawling is undertaken by a few small inshore UK vessels.

Fishing activity in Land's End and Cape Bank MPA is currently managed via an MMO byelaw – 'The Lands End and Cape Bank European Marine Site (Specified Areas) Bottom Towed Gear Byelaw' - prohibiting bottom towed fishing gear activity in

the majority of the site. VMS records show evidence of possible bottom towed gear activity in the site from both UK and non-UK vessels. MMO marine officers advise these are likely to be false fishing records owing to vessels travelling at slower speeds (and therefore falsely considered to be fishing) due to vessels travelling against strong tidal movements in the area or to time their arrival into local ports with sufficient tide to allow entry and/or the allotted time provided by harbourmasters.

Fishing activity in North Norfolk Sandbanks and Saturn Reef MPA is conducted overwhelmingly by non-UK vessels (97%), particularly Dutch beam trawlers. There is also a small amount of beam trawling occurring from UK vessels. Otter trawling also occurs within the site at a much lower level, primarily from non-UK vessels.

Fishing activity in Offshore Brighton MPA consists mainly of non-UK activity (97%). The majority of the non-UK activity is from French vessels using mostly otter trawls followed by dredges and then demersal seines. The limited fishing activity from UK vessels is split evenly between dredging and seining.

Fishing activity in South of Celtic Deep MPA consists of non-UK vessels (83%) particularly Irish beam trawlers. However, some bottom otter trawling and dredging activity by non-UK vessels also occurs.

Fishing activity in Wight-Barfleur Reef MPA is almost exclusively (99%) conducted by non-UK vessels. French dredgers and bottom otter trawlers are most prevalent with some limited seining activity from other non-UK fishing vessels. The limited UK bottom towed gear activity that does occur is also via dredge and bottom otter trawl gears.

Landings associated with VMS for UK vessels within the management areas for most recent six years of landings available (2016 - 2021) are displayed in Table 6. For context, non-UK vessels VMS activity (2016 – 2021) are displayed in Table 8. The closure of fishing grounds can lead to significant displacement of fishing effort which can result in a range of costs. Displacement is dependent on the intensity and distribution of fishing activities within the site before the closure and on external factors (such as fish distribution, total allowable catch/quota, fuel prices).

As the use of bottom towed fishing gear is already prohibited within the Land's End to Cape Bank management area, there are no landings for this site. As there are no additional economic impacts as a result of this byelaw, the site is not listed within the tables presented.

During formal consultation economic data for 2022/2023 was provided for a small number of vessels fishing within ICES rectangle 31F1, which contains Goodwin Sands MPA and Foreland MPA. The data indicated a potentially high-value squid fishery. This data is not considered within this DMA, and therefore may represent an underestimate, however the vessels do not appear to be fishing significantly within

the management areas, and therefore the vast majority of this activity would not be directly effected by the proposal and should not be considered within this DMA.

## Box 1. Non-UK fishing vessels

Although the focus of this DMA are the impacts on UK businesses and public bodies, vessels registered in other countries ('non-UK vessels') may also have access to fish in the management areas.

Non-UK landings data are only available for vessels from EU member states (EUMS). Landings cannot be estimated for other nations such as European Free Trade Association (EFTA) member states (Iceland, Liechtenstein, Norway, and Switzerland) and have therefore not been included. For non-UK, non-EU nations, MMO only has VMS evidence for Norwegian activity within the management areas. It is unclear what fishing gears these vessels are using but activity from Norwegian vessels is very low and there is likely to be minimal financial impact (Table 4).

Estimates of fisheries landings values by EUMS vessels were determined by apportioning landings data provided by the European Commission Scientific, Technical and Economic Committee for Fisheries (STECF) for the ICES rectangles to the intersecting management areas (Table 5). For vessels larger than 12m in length, landings were estimated using the proportion of EUMS VMS bottom towed gear fishing activity occurring in the management areas versus the ICES rectangles (Table 5). For vessels less than 12 m in length, landings were estimated by apportioning ICES rectangle level landings data to the management areas based on the proportion of the ICES rectangle that intersects a given management area. This provided an estimate of EUMS landings derived from the management area for the years 2016 – 2021. Landings estimates for <12 m vessels are likely to be a significant overestimate as the methodology described above assumes fishing activity of <12 m vessels is distributed evenly throughout an ICES rectangle. EUMS fishing activity of smaller vessels is more likely to take place in the areas of the ICES rectangles which are within their own territorial waters than England's and therefore outside of the management areas.

Discounting 2020 due to the impacts of Covid-19, between 2016 – 2019 and 2021 an annual average of £1,615,795 was estimated to be derived from the management areas by EUMS vessels using bottom towed gear. Annual landings derived from the management areas by EUMS vessels using bottom towed gear were £1,628,872 in 2016, £1,518,492 in 2017, £1,787,723 in 2018, £2,386,993 in 2019 and 756,895 in 2021.

It is important to note that in contrast to the estimated costs to UK fishing vessels, estimated costs to EUMS vessels are based on the values of fish landed, rather than operating profit. The costs to EUMS vessels are therefore considerably overestimated as the costs are based solely on revenue from landings rather than

operating profit. Furthermore, as per UK vessels, EUMS vessels are likely to offset some of their lost revenue by fishing in other areas. The potential impacts presented to EUMS vessels in this DMA are best estimates based on historic fishing activity. However, it is likely that future impacts on the Dutch trawling fleet as a result of the byelaw are overestimated in the DMA, as a number of these vessels will no longer operate in the area as a result of a decommissioning scheme.

For completeness, Table 9 presents best and worst-case landings scenarios where the best-case scenario assumes no bottom towed gear landings from within the ICES rectangles were derived from the management areas and the worst-case scenario assumes all bottom towed gear landings from the ICES rectangles were derived from within the management areas.

Using the methodology presented in 4.3, total familiarisation costs to non-UK vessels is £12,519, at a cost of £39 per vessel.

### 4.3 Familiarisation costs

The familiarisation cost is the cost to fishers of reading the byelaw. MMO have estimated that 328 UK vessels will be affected by the byelaw, and it is assumed that one fisher per vessel will be required to read the document. The draft byelaw is currently 4,836 words. Based upon the lower limit of reading technical text of 50 words per minute (EFTEC, 2013), there would be a required read time of 97 minutes per vessel. This means the total time spent reading the document across all 328 UK vessels will be 31,816 minutes, or approximately 530 hours. Fishers normally receive a crew share rather than a fixed salary, so incomes can vary dramatically across different vessel sizes and types, but the average salary for employees in fishing and aquaculture in 2021 was £32,937 (ONS, 2022a). There are 52.1 weeks in a year, assuming the statutory annual leave of 5.6 weeks including bank holidays this leaves 46.5 working weeks<sup>25</sup>. Assuming an average 36 hour working week (ONS, 2022b), this means 1,674 hours worked a year. An average salary of £32,937 split across 1,674 hours generates a wage per hour of £19.68. At £19.68 per hour, the 530 hours spent reading the document across all vessels would generate a cost of £10,436. A 22% uplift for non-wage labour hourly costs needs to be added to generate the total familiarisation costs, which will be a final familiarisation cost of £12,732, at a cost of £39 per vessel (RPC, 2019). The total familiarisation cost of implementing the byelaw will be £12,732.

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<sup>25</sup> [www.gov.uk/holiday-entitlement-rights](http://www.gov.uk/holiday-entitlement-rights)



## 4.4 Monitoring and compliance

MMO compliance action is intelligence-led and risk-based in accordance with the National Intelligence Model<sup>26</sup> (NCPE, 2005). Where intelligence suggests non-compliance or a risk of non-compliance with the byelaw, compliance resources will be deployed accordingly. This may include a Royal Navy fisheries patrol vessel presence, MMO fisheries patrol vessel presence or joint operations with other agencies (for example the Border Force or the Environment Agency). Joint operations are not monetised here as they are requested on an *ad hoc* basis and costs can vary. MMO will coordinate any joint operations. The principles by which MMO will regulate marine protected areas are set out by the Legislative and Regulatory Reform Act 2006<sup>27</sup> and the Regulators' Compliance Code<sup>28</sup> and aim to ensure that MMO is proportionate, accountable, consistent, transparent and targeted in any compliance action it takes.

Compliance costs for the inspection of MPAs and associated byelaws do not represent an additional cost. MPA inspections take place under standard operating procedure of Royal Navy/MMO fisheries patrol vessels. MPA and byelaw inspection costs are therefore absorbed by existing compliance systems and will not be considered here.

## 4.5 Total monetised costs

The economic impacts of the management areas are estimated as the loss of profitability of fishing effort at the site. This is informed by data from MMO on potential activity within the area and from the 2016 - 2019 Seafish data on the profitability of fishing<sup>29</sup>. This estimate of operating profit combines cost and earning information provided by the vessel owners to the annual Seafish UK Fleet Survey with official landings and capacity data for vessels actively fishing within the management area provided by the MMO. Operating profit metrics for 2021 were not available, therefore MMO have calculated an annual average of 2016 to 2019 operating profit for each management area and used this to estimate operating profit in 2021 (Table 6).

The MMO assigns gear and landings information to UK VMS fishing activity data via electronic logbook data submitted by fishers. MMO have estimated bottom towed gear landings via vessels larger than 12 m using this landings-linked VMS data from within the management areas.

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<sup>26</sup> <https://library.college.police.uk/docs/npia/NIM-Code-of-Practice.pdf>

<sup>27</sup> [www.legislation.gov.uk/ukpga/2006/51/contents](http://www.legislation.gov.uk/ukpga/2006/51/contents)

<sup>28</sup> [www.gov.uk/government/publications/regulators-code](http://www.gov.uk/government/publications/regulators-code)

<sup>29</sup> <https://public.tableau.com/app/profile/seafish/viz/FleetEnquiryTool/1Overview>

Landings for vessels smaller than 12 m in length are only available at ICES rectangle level. To estimate the bottom towed gear landings derived from the management areas by such smaller vessels MMO have apportioned ICES rectangle landings data to management areas based on the area of the management area versus the ICES rectangle vessels. This estimate assumes landings from these smaller vessels are distributed evenly across the ICES rectangle. However, smaller vessels are more likely to be fishing closer to shore and therefore outside of the offshore management areas. As such, landings and ultimately operating profit estimates for vessels smaller than 12 m in length are likely to be an overestimate.

Seafish operating profit data was not available for Haig Fras MPA (2016 - 2020), North Norfolk Sandbanks and Saturn Reef MPA (2016) and Wight-Barfleur Reef MPA (2016 and 2020) because there were too few vessels operating in the management areas. To estimate operating profit for these years, the operating profit ratios for the ICES rectangle were applied to any landings for these sites. However, due to too few vessels operating in the relevant ICES rectangle, no operating profit figures could be estimated for Haig Fras MPA. There were minimal UK landings obtained from the Haig Fras MPA management area and therefore operating profit is expected to be insignificant. Operating profits for all management areas are presented in Table 7.

Landings presented for Offshore Brighton MPA are likely to be an overestimate, this is due to a mapping issue identified following formal consultation. Figure 11 shows the updated management area with a reduction of 39.06 km<sup>2</sup> from 239.79 km<sup>2</sup> to 200.73 km<sup>2</sup> compared to the area presented at formal consultation. Landings values were calculated for the larger area prior to the update, but have not been recalculated due to the relatively small change in size of the management area.

An estimate of £36,442 has been made for the average annual operating profit for UK landings derived from the management areas (Table 6).

A discount rate of 3.5% was applied to calculate the present value and 2019 was used as the price base year. The best estimate of highest net 2020 present value cost over ten years to the UK fishing industry of introducing management is estimated to be £326,413.

**Table 5. EU member state vessel landings by value (£) for all management areas combined.**

Year	Under 12m*	Over 12m	Total
2016	1,155	1,627,717	1,628,872
2017	3,652	1,514,841	1,518,492
2018	2,440	1,785,283	1,787,723
2019	8,157	2,378,836	2,386,993
2020	30,356	2,029,135	2,059,491
2021	18,725	738,170	756,895
<b>Total (2016 – 2019, 2021)</b>	<b>34,129</b>	<b>8,044,847</b>	<b>8,078,976</b>
<b>Annual Average (2016 – 2019, 2021)</b>	<b>6,826</b>	<b>1,608,969</b>	<b>1,615,795</b>

**Table 6. Estimated UK landings values (£) and operating profit (£) for vessels using bottom towed fishing gears in all management areas. Operating profit figures 2016-2020 are based on Seafish economic data. \*Operating profit for 2021 has been calculated using the weighted average operating profit margin (2016-2019) (14%).**

Year	Total landed value (£)	Operating profit (£)
2016	211,442	46,011
2017	232,365	45,753
2018	273,566	24,357
2019	346,360	34,288
2020	259,149	21,252
2021	198,083	31,801
<b>Annual Average (2016 – 2019, 2021)</b>	<b>252,363</b>	<b>36,442</b>

#### 4.6 Non-monetised costs

The management measures could lead to displacement of fishing activities to sensitive habitats elsewhere in English seas, increasing pressure on fauna and habitats in these areas (Hiddink *et al.*, 2006, Vaughan, 2017). However, it is not possible to accurately predict the location (and thus the associated costs) of displaced fishing activity.

MPAs were chosen to protect rare and representative habitats, species, and geological features that contribute to an ecologically coherent network. The potential impact of displacement to areas outside of MPAs does not remove the requirement to introduce management in order to further the conservation objectives of the

MPAs. The addition of management could result in some displacement of the fishing fleet to other fishing grounds, where there may be competition from an existing fishing fleet, which could in-turn reduce profits of those fishing within the MPAs and to those currently fishing outside of the MPAs where activity is displaced to.

#### 4.7 Non-monetised benefits

Marine ecosystems are essential for primary production and climate regulation, providing vital functions which support life. They also provide several ecosystem services (associated benefits), which are ‘the benefits which humans obtain from ecosystem functions and resources’ (Fontana et al., 2013) at a local and global scale (Rees et al., 2018).

To sustainably manage ecosystems which provide many benefits and interdependencies between natural and human systems, several national and international policy targets exist (Ashley et al., 2018). The UK’s vision for ‘clean, healthy, safe, productive and biologically diverse ocean and seas’ is reflected in the UK Marine Strategy, helping the UK deliver its international obligations and commitments under the UN Convention on the Law of the Sea (UNCLOS), the OSPAR North-East Atlantic Environment Strategy, the Convention on Biological Diversity, and the UN Sustainable Development Goal 14 to conserve and sustainably use the oceans, seas and marine resources for sustainable development (Defra, 2019). At a national level, the UK Marine Strategy sets out objectives, targets, and indicators for the achievement of good environmental status in our seas (Defra, 2019).

Natural capital (defined below) approaches are central to the UK Government 25 Year Environment Plan (Ashley et al., 2018; HM Government, 2018) which aims to enhance our natural capital, with policy choices being better-informed by natural capital approaches (HM Government, 2018).

Natural capital is the sum of our ecosystems, species, freshwater, land, soils, minerals, our air and our seas. These are all elements of nature that either directly or indirectly bring value to people and the country at large.

**25 Year Environment Plan (HM Government, 2018)**

Looking at the marine environment through a natural capital lens helps us to understand the assets within ecosystems which have the capacity to provide goods and services (Rees et al., 2018). Understanding the many diverse functions and values a habitat or species provides within an ecosystem helps to better secure and understand the associated indirect benefits different management approaches may provide.

For example, prohibiting the use of damaging activities may enhance the level of certain ecosystem services provided by MPA features and sub-features, such as climate regulation (Fletcher et al., 2012) and reducing wave energy (McManus, 2011), and recreational opportunities for SCUBA diving and sea angling can be protected.

Below are some of the ecosystem services that features considered in this assessment may provide.

#### 4.7.1 Moderate and high energy circalittoral rock, and rocky reef

- Species diversification and formation of species habitat – circalittoral rock provides firm substrate for attachment and supports a diverse array of species such as polychaetes, sponges, cnidarians, and bryozoans (Jones, Hiscock, and Connor, 2000).
- Primary biomass production - circalittoral communities are largely generated from phytoplankton which supports benthic and pelagic organisms at higher trophic levels (Jones, Hiscock, and Connor, 2000). Also, a significant proportion of primary production sinks to the sea floor and is assimilated into the subtidal sediment (Jensen et al., 2003).
- Secondary biomass production – circalittoral communities are important secondary producers through growth of epibiotic organisms including sponges and tunicates (Jones, Hiscock, and Connor 2000).
- Tourism/recreation – circalittoral rock is a potential location for SCUBA diving and angling due to the high concentration of animal life.

#### 4.7.2 Biogenic reef (*Sabellaria* spp.)

- Formation of a physical barrier – biogenic reefs can reduce incident wave energy (McManus, 2001).
- Species diversification and formation of species habitat – biogenic *Sabellaria spinulosa* reefs have a rich associated infauna and epifauna. The reefs provide firm substrate for attachment and support a diverse array of species such as polychaetes, sponges, cnidarians, and bryozoans (JNCC, 2022). *S. spinulosa* reef habitats are of greatest nature conservation significance as they occur on predominantly sediment or mixed sediment areas (Fletcher et al., 2012). These enable a range of epibenthic species with their associated fauna and a specialised ‘crevice’ infauna, which would not otherwise be found in the area, to become established (Maddock, 2008).
- Secondary biomass production – biogenic reefs are important secondary producers through growth of epibiotic organisms including sponges and tunicates. (Jones, Hiscock, and Connor, 2000).
- Climate regulation - subtidal biogenic reefs play a major role in the global carbon cycle and act as a major store of carbon (Fletcher et al., 2012).

## 5 Recommended management options

Following the above assessment, the recommended management option is Option 2: Removal of pressures from specified management areas of designated feature via prohibition of bottom towed fishing. This may include a whole site prohibition where sensitive designated features are distributed throughout the whole site.

This will be achieved through implementation of the Marine Protected Areas Bottom Towed Fishing Gear Byelaw 2023. The byelaw will include an appropriate buffer to ensure bottom towed fishing activities occurring adjacent to highly sensitive designated features do not negatively impact those features. The recommended option would ensure adequate protection to deliver healthier marine ecosystems and the ecosystem services they provide, whilst balancing the costs to business that fishers will incur.

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## 7 Annex: Tables and figures

For all tables presented Land's End to Cape Bank has been omitted, this is due to the use of bottom towed fishing gears already being prohibited by an existing byelaw. The introduction of this byelaw presents no additional economic impacts.

**Table 7. Estimated UK landings by value (£) for each management area.**

Management Area	Landings						Annual average landings value from 2016 - 2019, 2021 (£)	Total landings value from 2016 - 2019, 2021 (£)
	2016	2017	2018	2019	2020	2021		
<b>Cape Bank MPA</b>	72,576	55,852	37,714	98,354	52,981	104,956	73,890	369,451
<b>East of Haig Fras MPA</b>	95,439	86,614	150,859	90,021	62,665	4,073	85,401	427,006
<b>Farnes East MPA</b>	10,198	41,313	13,961	41,735	8,141	8,416	21,124	115,622
<b>Foreland MPA</b>	15,165	18,159	56,466	57,253	91,680	41,715	37,752	188,758
<b>Goodwin Sands MPA</b>	14,059	11,896	5,093	29,436	16,481	14,440	14,985	74,925
<b>Haig Fras MPA</b>	0	599	0	0	0	0	120	599
<b>Haisborough, Hammond and Winterton MPA</b>	1,346	2,727	1,711	1,987	5,387	4,445	2,443	12,215
<b>Hartland Point to Tintagel MPA</b>	177	2,155	1,815	3,469	1,405	3,912	2,306	11,529
<b>North Norfolk Sandbanks and Saturn Reef MPA</b>	1,839	2,346	12	390	4,700	57	929	4,644
<b>Offshore Brighton MPA</b>	154	519	23	335	0	3,912	989	4,943
<b>South of Celtic Deep MPA</b>	488	7,288	2,287	19	293	0	2,016	10,082
<b>Wight-Barfleur MPA</b>	0	2,899	3,625	23,362	15,416	12,157	8,408	42,042

**Table 8. Estimated UK operating profit value (£) for each management area. 2016-2020 Seafish operating profits have been presented, 2021 Seafish operating profit was not available at time of assessment, therefore an annual average operating profit (2016-2019) for each management area was calculated and applied to 2021 landings figures.**

Management Area	Operating Profit					
	2016	2017	2018	2019	2020	2021
<b>Cape Bank MPA</b>	19,537	13,067	5,537	18,682	11,512	22,030
<b>East of Haig Fras MPA</b>	18,767	17,827	13,155	6,430	2,551	571
<b>Farnes East MPA</b>	2,114	7,801	2,064	5,118	788	1,402
<b>Foreland MPA</b>	3,823	2,903	2,044	1,297	650	4,906
<b>Goodwin Sands MPA</b>	1,674	1,217	895	3,377	3,721	1,842
<b>Haig Fras MPA*</b>	-	-	-	-	-	-
<b>Haisborough, Hammond and Winterton MPA</b>	-	543	183	-1,259	1,355	-485
<b>Hartland Point to Tintagel MPA</b>	66	792	311	643	675	773
<b>North Norfolk Sandbanks and Saturn Reef MPA*</b>	-	-	-	-	-	-
<b>Offshore Brighton MPA</b>	30	-	-	-	-	762
<b>South of Celtic Deep MPA</b>	-	1,549	168	-	-	-
<b>Wight-Barfleur MPA**</b>	-	-	-	-	-	1,589

\*due to limited vessels fishing in the site/ ICES rectangle operating profit could not be shared due to confidentiality concerns.

\*\*Average operating profit for all sites 13.07% applied to 2021 landings to provide 2021 estimate.

**Table 9. Non-UK bottom towed gear VMS records per year by management area.**

<b>Management Area</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2016 – 2019, 2021 Total</b>
<b>Cape Bank MPA</b>	131	102	118	73	64	64	488
<b>East of Haig Fras MPA</b>	68	60	51	51	35	42	272
<b>Farnes East MPA</b>	0	1	0	0	0	0	1
<b>Foreland MPA</b>	42	34	52	79	80	35	242
<b>Goodwin Sands MPA</b>	14	11	11	12	16	5	53
<b>Haig Fras MPA</b>	43	46	36	41	26	20	186
<b>Haisborough, Hammond and Winterton MPA</b>	15	16	14	12	9	10	67
<b>Hartland Point to Tintagel MPA</b>	0	0	0	0	0	0	0
<b>North Norfolk Sandbanks and Saturn Reef MPA</b>	37	40	34	34	25	12	157
<b>Offshore Brighton MPA</b>	48	32	27	24	29	43	174
<b>South of Celtic Deep MPA</b>	8	8	6	16	8	13	51
<b>Wight-Barfleur MPA</b>	30	27	29	28	37	34	148
<b>Grand Total</b>	<b>436</b>	<b>377</b>	<b>378</b>	<b>370</b>	<b>329</b>	<b>278</b>	<b>1839</b>

**Table 10. EU27 2016 - 2021 best-case and worst-case EU member state landings by value (£). The best-case scenario assumes that no landings attributed to the ICES rectangles (for bottom towed gears) were derived from the management areas. The worst-case scenario assumes that all landings from bottom towed gears from within the ICES rectangles were derived from the management areas. Both scenarios contrast with Table 9 and Table 11 (landings estimated using the proportion of VMS fishing activity in the management area versus the rectangle). Values represent landings by bottom towed gear types for all EU member states. Landings values were not available for European Free Trade Association member states.**

	2016	2017	2018	2019	2020	2021	Annual Average 2016 – 2019, 2021
<b>&gt;12 m vessels</b>	1,627,717	1,514,841	1,785,283	2,378,836	2,029,135	738,170	1,608,969
<b>&lt;12 m vessels</b>	1,155	3,652	2,440	8,157	30,356	18,725	6,826
<b>Worst case</b>	1,628,872	1,518,493	1,787,723	2,386,993	2,059,491	756,895	1,615,795
<b>Best case</b>	0	0	0	0	0	0	0

**Table 11. Estimated non-UK total landings value (£) per management area.**

<b>Management area and non-UK nation</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2016 – 2019, 2021 Total (£)</b>	<b>2016 – 2019, 2021 Average (£)</b>
<b>Cape Bank MPA</b>	<b>348,167</b>	<b>170,352</b>	<b>268,671</b>	<b>126,902</b>	<b>188,058</b>	<b>191,503</b>	<b>1,105,595</b>	<b>221,119</b>
<b>East of Haig Fras MPA</b>	<b>150,662</b>	<b>160,396</b>	<b>136,735</b>	<b>137,511</b>	<b>82,288</b>	<b>132,672</b>	<b>717,974</b>	<b>143,595</b>
<b>Farnes East MPA</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Foreland MPA</b>	<b>441,458</b>	<b>161,603</b>	<b>559,051</b>	<b>1,153,535</b>	<b>870,342</b>	<b>59,443</b>	<b>2,375,090</b>	<b>475,018</b>
<b>Goodwin Sands MPA</b>	<b>53,197</b>	<b>31,948</b>	<b>45,538</b>	<b>51,208</b>	<b>15,037</b>	<b>4,614</b>	<b>186,506</b>	<b>37,301</b>
<b>Haig Fras MPA</b>	<b>75,678</b>	<b>60,538</b>	<b>91,957</b>	<b>38,919</b>	<b>22,471</b>	<b>17,833</b>	<b>284,925</b>	<b>56,985</b>
<b>Haisborough, Hammond and Winterton MPA</b>	<b>138,525</b>	<b>255,496</b>	<b>126,113</b>	<b>125,238</b>	<b>102,996</b>	<b>112,406</b>	<b>757,779</b>	<b>151,556</b>
<b>Hartland Point to Tintagel MPA</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>North Norfolk Sandbanks and Saturn Reef MPA</b>	<b>311,032</b>	<b>527,953</b>	<b>243,177</b>	<b>525,824</b>	<b>627,359</b>	<b>96,367</b>	<b>1,704,356</b>	<b>340,872</b>
<b>Offshore Brighton MPA</b>	<b>59,524</b>	<b>53,996</b>	<b>80,923</b>	<b>47,139</b>	<b>34,064</b>	<b>42,744</b>	<b>284,325</b>	<b>56,865</b>
<b>South of Celtic Deep MPA</b>	<b>6,750</b>	<b>6,400</b>	<b>16,280</b>	<b>10,930</b>	<b>9,318</b>	<b>12,286</b>	<b>52,647</b>	<b>10,529</b>
<b>Wight-Barfleur MPA</b>	<b>43,877</b>	<b>89,811</b>	<b>219,279</b>	<b>169,787</b>	<b>107,559</b>	<b>87,026</b>	<b>609,780</b>	<b>121,956</b>
<b>Total landings (£)</b>	<b>1,628,870</b>	<b>1,518,493</b>	<b>1,787,724</b>	<b>2,386,993</b>	<b>2,059,492</b>	<b>756,894</b>	<b>8,078,977</b>	<b>1,615,796</b>

**Table 12. Estimated annual landed value (£) from management areas by non-UK > 12 m and < 12 m vessels.**

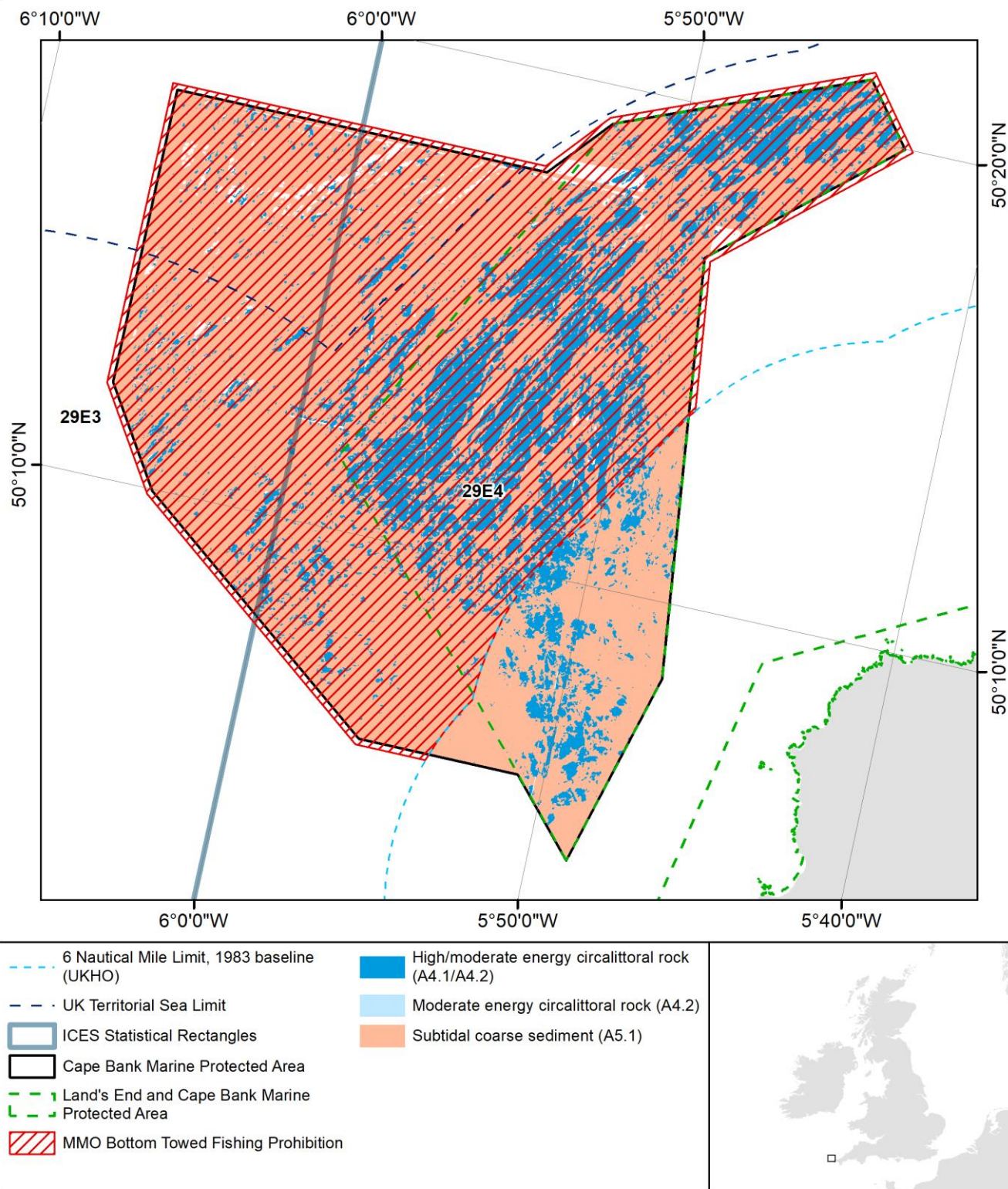
Management area and non-UK nation	2016		2017		2018		2019		2020		2021	
	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m
<b>Cape Bank MPA</b>	<b>348,167</b>	<b>0</b>	<b>170,352</b>	<b>0</b>	<b>268,671</b>	<b>0</b>	<b>126,902</b>	<b>0</b>	<b>188,058</b>	<b>0</b>	<b>191,503</b>	<b>0</b>
Belgium	125,034	-	83,798	-	95,705	-	81,093	-	155,179	-	153,641	-
France	223,134	-	86,130	-	172,965	-	45,809	-	32,878	-	37,862	-
Ireland	0	-	424	-	0	-	0	-	0	-	0	-
<b>East of Haig Fras MPA</b>	<b>150,662</b>	<b>0</b>	<b>160,396</b>	<b>0</b>	<b>136,735</b>	<b>0</b>	<b>137,511</b>	<b>0</b>	<b>82,288</b>	<b>0</b>	<b>132,672</b>	<b>0</b>
Belgium	0	-	728	-	0	-	0	-	0	-	0	-
France	138,067	-	156,120	-	132,596	-	133,556	-	79,078	-	125,575	-
Ireland	12,594	-	3,547	-	4,139	-	3,955	-	3,210	-	7,096	-
<b>Farnes East MPA</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Netherlands	0	-	0	-	0	-	0	-	0	-	0	-
<b>Foreland MPA</b>	<b>441,378</b>	<b>80</b>	<b>161,601</b>	<b>1</b>	<b>558,725</b>	<b>325</b>	<b>1,153,464</b>	<b>71</b>	<b>870,145</b>	<b>197</b>	<b>59,440</b>	<b>3</b>
Belgium	5,176	-	868	-	41,923	-	144,416	-	103,995	-	9,265	-
Germany	0	-	0	-	0	-	0	-	898	-	0	-
France	435,969	-	160,733	-	515,765	-	1,006,679	-	763,456	-	44,545	-
Netherlands	233	-	0	-	1,037	-	2,369	-	1,796	-	5,630	-
<b>Goodwin Sands MPA</b>	<b>53,163</b>	<b>34</b>	<b>31,948</b>	<b>0</b>	<b>45,396</b>	<b>142</b>	<b>51,178</b>	<b>31</b>	<b>14,952</b>	<b>86</b>	<b>4,614</b>	<b>1</b>
Belgium	2,327	-	289	-	519	-	1,024	-	4,025	-	1,676	-
France	50,836	-	28,897	-	44,877	-	50,153	-	10,927	-	2,938	-
Netherlands	0	-	2,762	-	0	-	0	-	0	-	0	-
<b>Haig Fras MPA</b>	<b>75,678</b>	<b>0</b>	<b>60,538</b>	<b>0</b>	<b>91,957</b>	<b>0</b>	<b>38,919</b>	<b>0</b>	<b>22,471</b>	<b>0</b>	<b>17,832</b>	<b>0</b>
France	71,852	-	57,578	-	86,777	-	28,723	-	17,393	-	15,519	-
Ireland	3,826	-	2,960	-	5,180	-	10,196	-	5,078	-	2,314	-
<b>Haisborough, Hammond and Winterton MPA</b>	<b>138,525</b>	<b>0</b>	<b>255,496</b>	<b>0</b>	<b>126,113</b>	<b>0</b>	<b>125,238</b>	<b>0</b>	<b>102,718</b>	<b>278</b>	<b>111,085</b>	<b>1,321</b>
Belgium	1,988	-	0	-	1,342	-	538	-	0	-	0	-
France	5	-	0	-	0	-	0	-	0	-	0	-
Netherlands	136,533	-	255,496	-	124,771	-	124,701	-	102,718	-	111,085	-
<b>Hartland Point to Tintagel MPA</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>North Norfolk Sandbanks and Saturn Reef MPA</b>	<b>311,032</b>	<b>0</b>	<b>527,953</b>	<b>0</b>	<b>243,055</b>	<b>122</b>	<b>520,754</b>	<b>5,070</b>	<b>599,020</b>	<b>28,339</b>	<b>80,457</b>	<b>15,910</b>
Belgium	8,109	-	2,642	-	3,193	-	0	-	0	-	0	-
Germany	888	-	2,217	-	0	-	0	-	0	-	0	-
Denmark	0	-	0	-	0	-	31	-	0	-	0	-
France	0	-	1,050	-	0	-	0	-	0	-	0	-
Netherlands	302,035	-	522,045	-	239,862	-	520,723	-	599,020	-	80,457	-

Management area and non-UK nation	2016		2017		2018		2019		2020		2021	
	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m	> 12 m	< 12 m
<b>Offshore Brighton MPA</b>	<b>58,483</b>	<b>1,040</b>	<b>53,056</b>	<b>940</b>	<b>79,336</b>	<b>1,587</b>	<b>45,636</b>	<b>1,502</b>	<b>33,652</b>	<b>411</b>	<b>41,254</b>	<b>1,490</b>
Belgium	0	-	0	-	0	-	1,037	-	1,711	-	704	-
Germany	1,234	-	0	-	0	-	0	-	0	-	0	-
France	55,401	-	51,041	-	79,186	-	44,225	-	31,891	-	40,550	-
Ireland	0	-	0	-	0	-	242	-	49	-	0	-
Netherlands	1,848	-	2,015	-	150	-	132	-	0	-	0	-
<b>South of Celtic Deep MPA</b>	<b>6,750</b>	<b>0</b>	<b>6,400</b>	<b>0</b>	<b>16,280</b>	<b>0</b>	<b>10,930</b>	<b>0</b>	<b>9,318</b>	<b>0</b>	<b>12,286</b>	<b>0</b>
Belgium	0	-	0	-	0	-	0	-	0	-	1,380	-
France	1,922	-	4,143	-	432	-	4,508	-	2,811	-	3,243	-
Ireland	4,828	-	2,257	-	15,848	-	6,423	-	6,507	-	7,663	-
<b>Wight-Barfleur MPA</b>	<b>43,877</b>	<b>0</b>	<b>87,100</b>	<b>2,711</b>	<b>219,015</b>	<b>263</b>	<b>168,303</b>	<b>1,484</b>	<b>106,513</b>	<b>1,046</b>	<b>87,026</b>	<b>0</b>
Belgium	21,573	-	71,083	-	208,530	-	151,591	-	89,569	-	55,520	-
Germany	1,413	-	511	-	0	-	406	-	80	-	0	-
Denmark	0	-	511	-	358	-	0	-	0	-	0	-
France	20,647	-	14,483	-	8,962	-	16,302	-	16,786	-	23,214	-
Ireland	9	-	0	-	0	-	0	-	0	-	0	-
Netherlands	235	-	170	-	1,164	-	4	-	80	-	8,292	-
Portugal	0	-	341	-	0	-	0	-	0	-	0	-
<b>Total landings (£)</b>	<b>1,627,717</b>	<b>1,155</b>	<b>1,514,841</b>	<b>3,652</b>	<b>1,785,283</b>	<b>2,440</b>	<b>2,378,836</b>	<b>8,157</b>	<b>2,029,135</b>	<b>30,356</b>	<b>738,170</b>	<b>18,725</b>



# Cape Bank Marine Protected Area

MMO Prohibition of Bottom Towed Fishing



Date of Publication: 21/11/2022

Coordinate System: ETRS 1989 LAEA

Projection: Lambert Azimuthal Equal Area

Datum: ETRS 1989

MMO Reference: 10562

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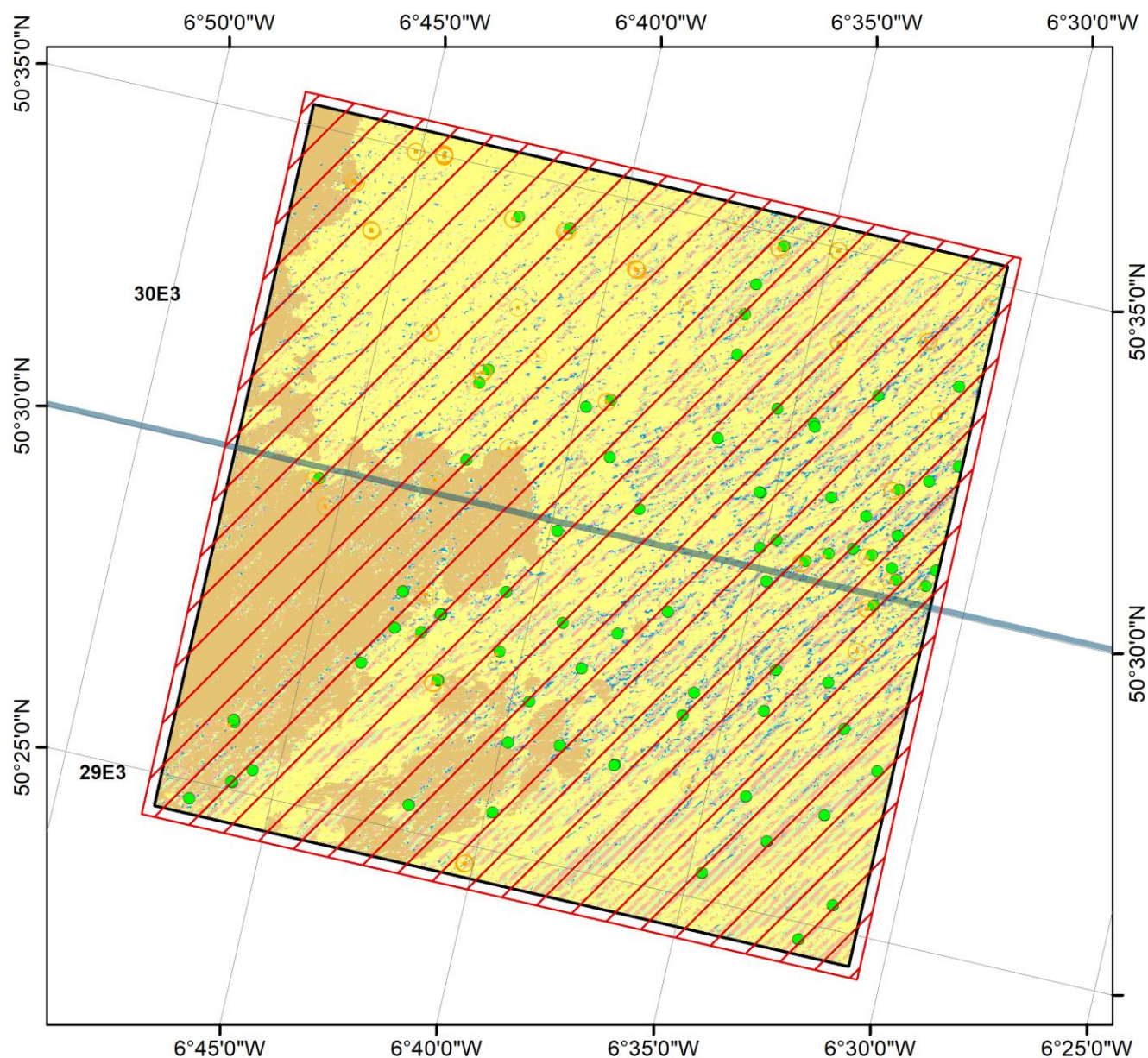
**Figure 2. Bottom towed gear management for Cape Bank MPA and Land's End and Cape Bank MPA.**





# East of Haig Fras Marine Protected Area

## MMO Prohibition of Bottom Towed Fishing



- |   |   |
|---|---|
| ICES Statistical Rectangles                 | High/moderate energy circalittoral rock (A4.1/A4.2) |
| East of Haig Fras Marine Protected Area     | Subtidal coarse/mixed sediments (A5.1/A5.4)         |
| MMO Bottom Towed Fishing Prohibition        | Subtidal sand (A5.2)                                |
| Sea pen and burrowing megafauna communities | Subtidal mud (A5.3)                                 |
| Fan mussel ( <i>Atrina fragilis</i> )       |   |



Date of Publication: 21/11/2022  
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 MMO Reference: 10562

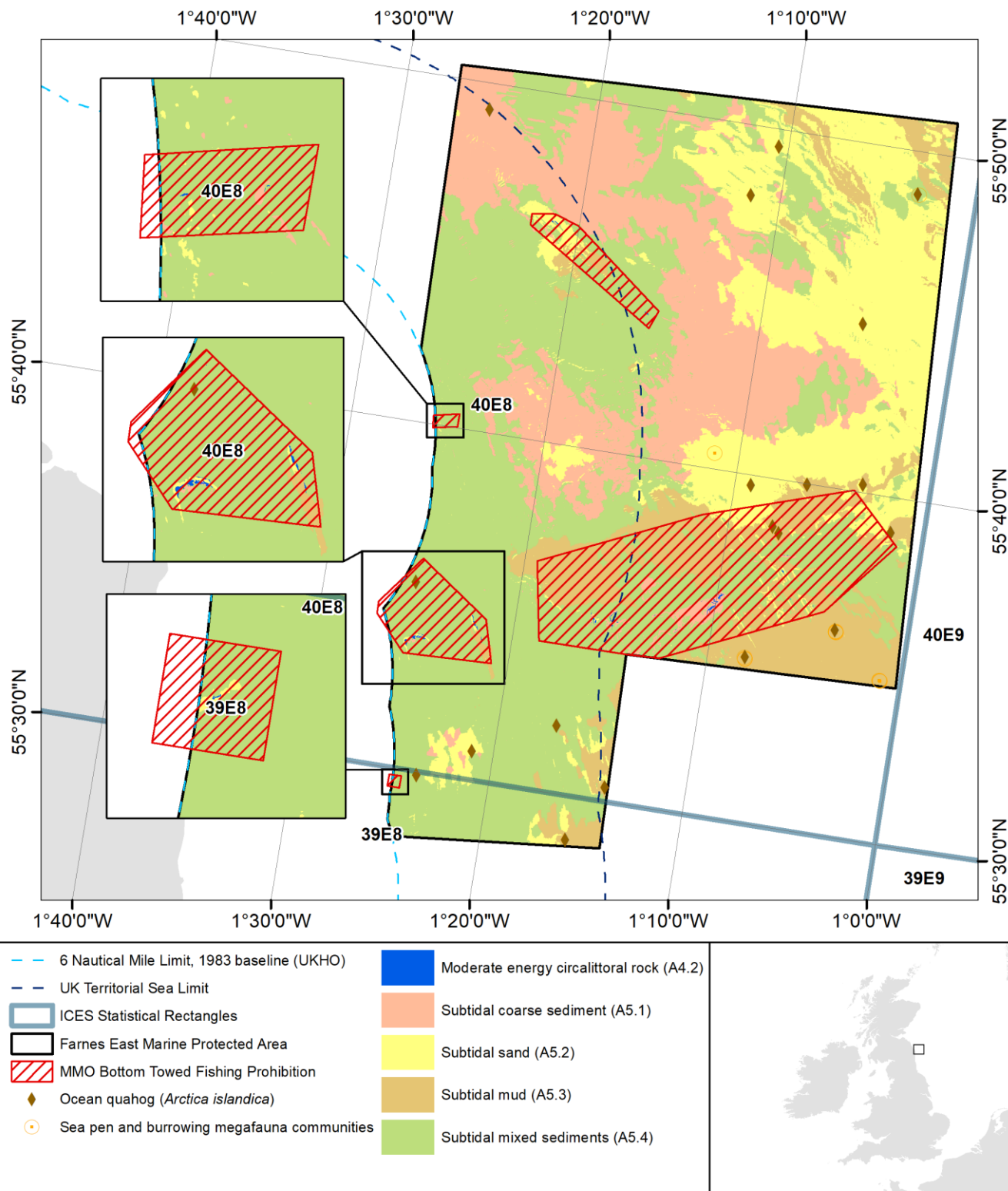
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**Figure 3. Bottom towed gear management for East of Haig Fras MPA.**



# Farnes East Marine Protected Area

## MMO Prohibition of Bottom Towed Fishing



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 Projection: Lambert Azimuthal Equal Area  
 Datum: ETRS 1989  
 MMO Reference: 10562

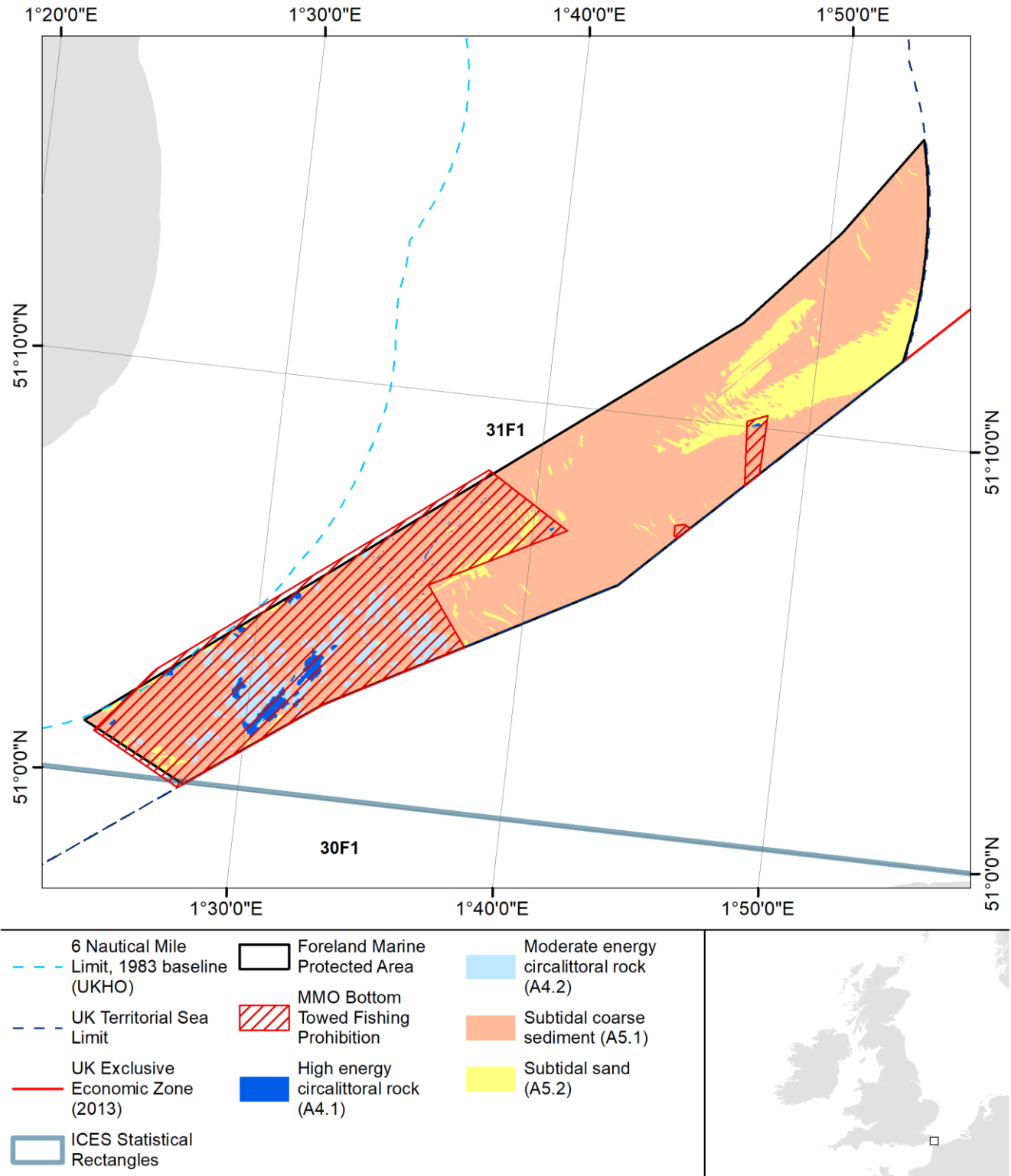
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Figure 4. Bottom towed gear management for Farnes East MPA.



# Foreland Marine Protected Area

## MMO Prohibition of Bottom Towed Fishing



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 Projection: Lambert Azimuthal Equal Area  
 Datum: ETRS 1989  
 MMO Reference: 10562

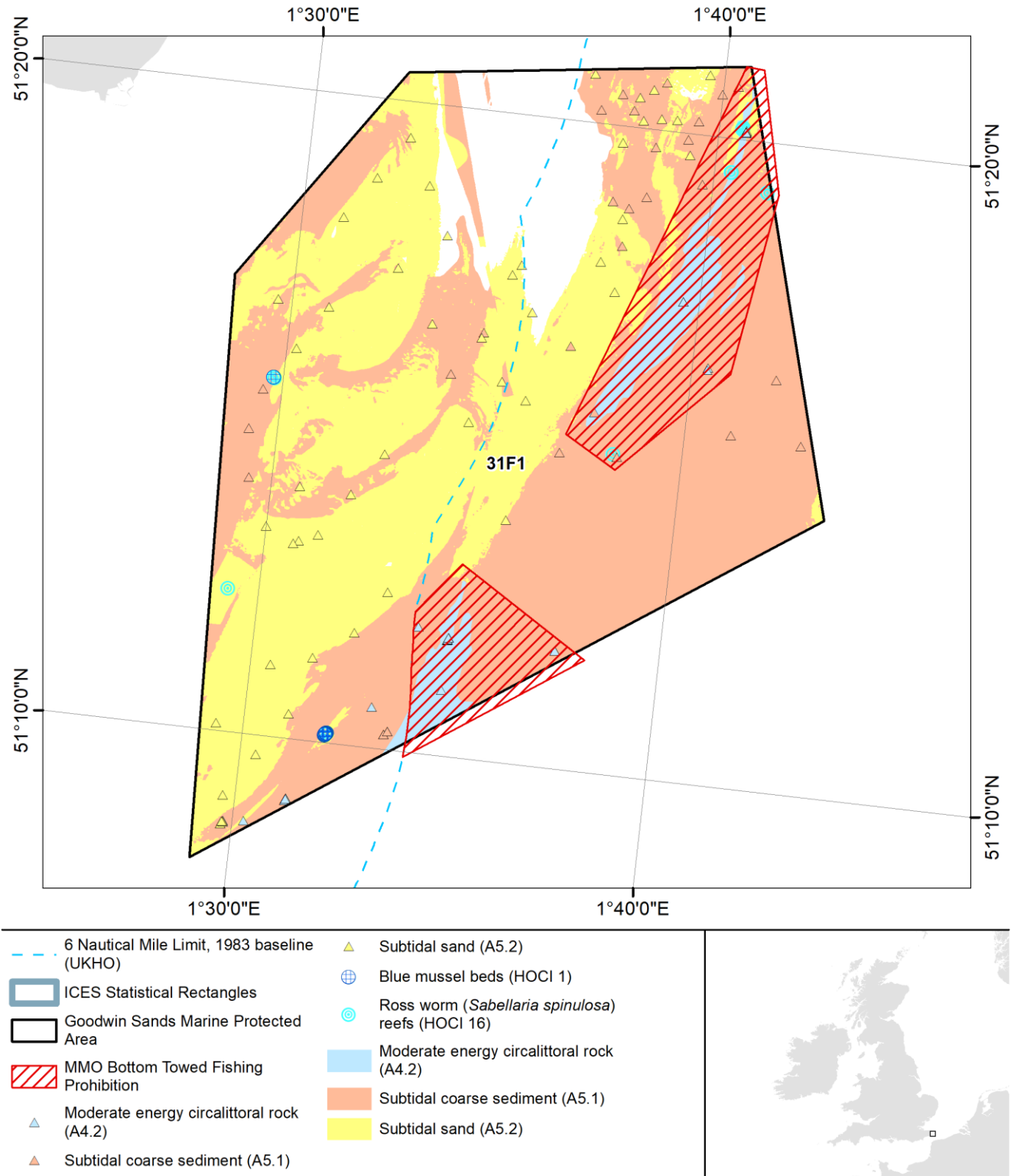
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Figure 5. Bottom towed gear management for Foreland MPA.



# Goodwin Sands Marine Protected Area

## MMO Prohibition of Bottom Towed Fishing



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 Projection: Lambert Azimuthal Equal Area  
 Datum: ETRS 1989  
 MMO Reference: 10562

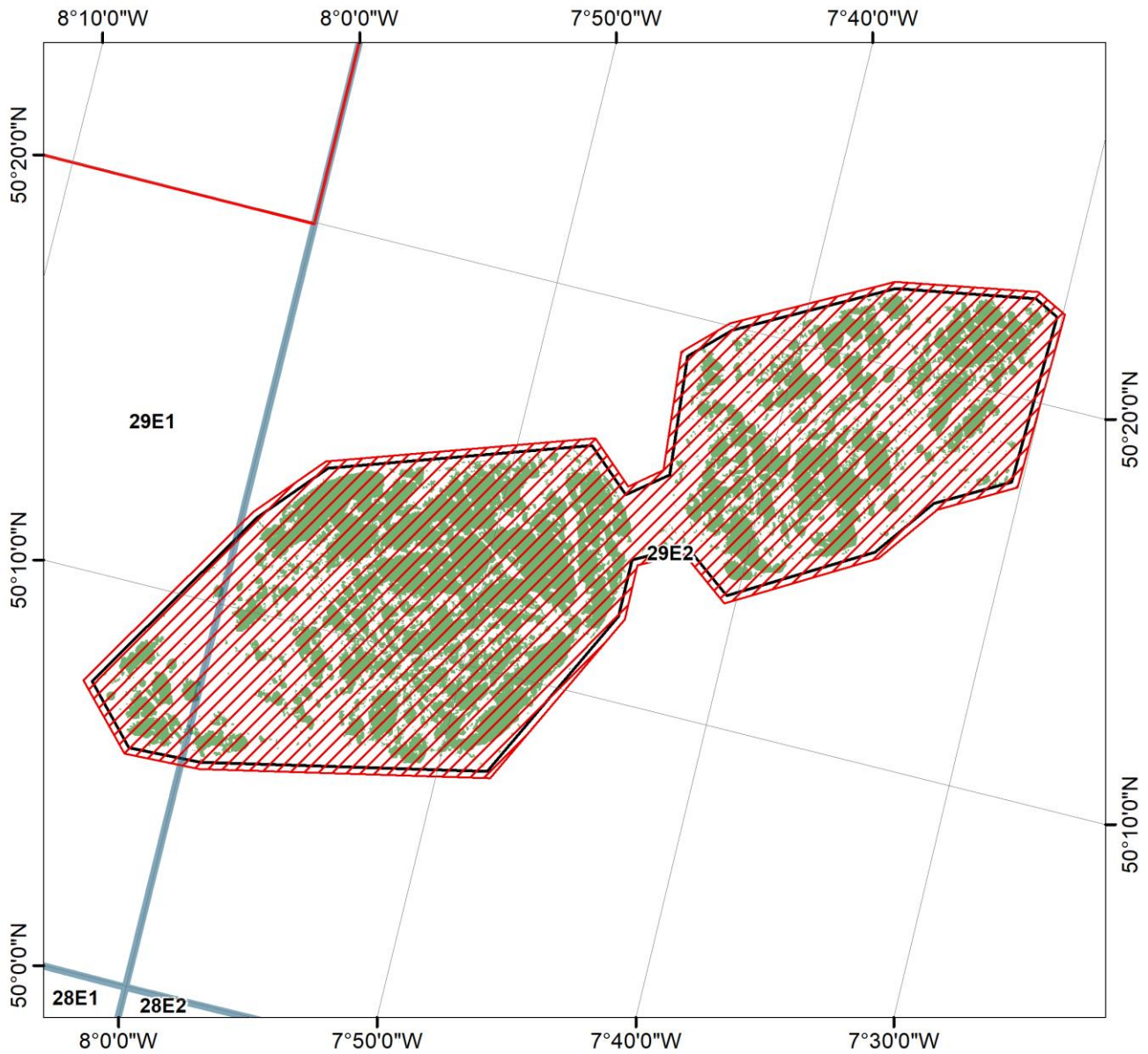
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Figure 6. Bottom towed gear management for Goodwin Sands MPA.



# Haig Fras Marine Protected Area

## MMO Prohibition of Bottom Towed Fishing



- UK Exclusive Economic Zone (2013)
- ICES Statistical Rectangles
- Haig Fras Marine Protected Area
- MMO Bottom Towed Fishing Prohibition
- Annex I Reef



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**Figure 7. Bottom towed gear management for Haig Fras MPA.**

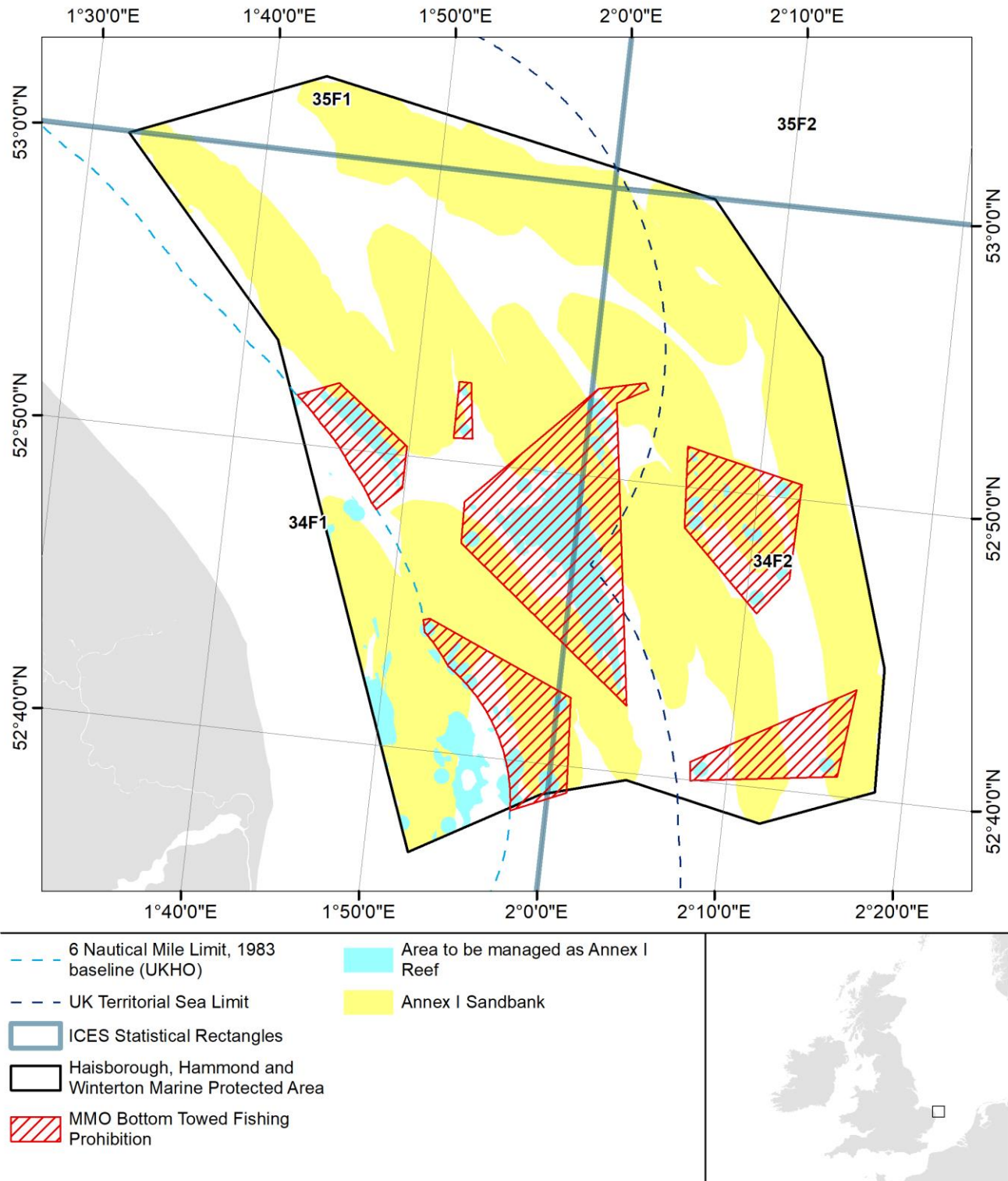
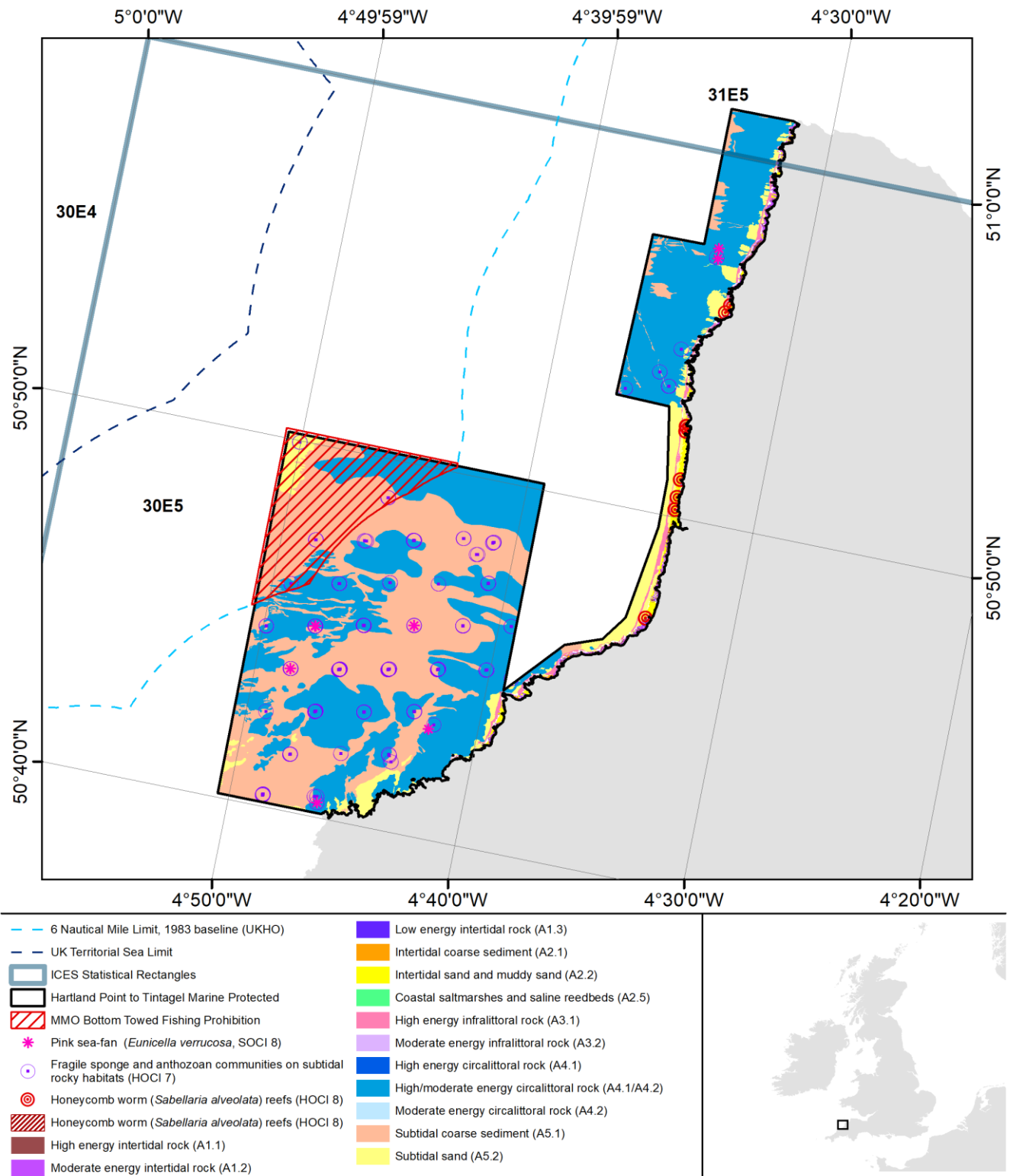


Figure 8. Bottom towed gear management for Haisborough, Hammond and Winterton MPA.



# Hartland Point to Tintagel Marine Protected Area

## MMO Prohibition of Bottom Towed Fishing



Date of Publication: 21/11/2022

Coordinate System: ETRS 1989 LAEA

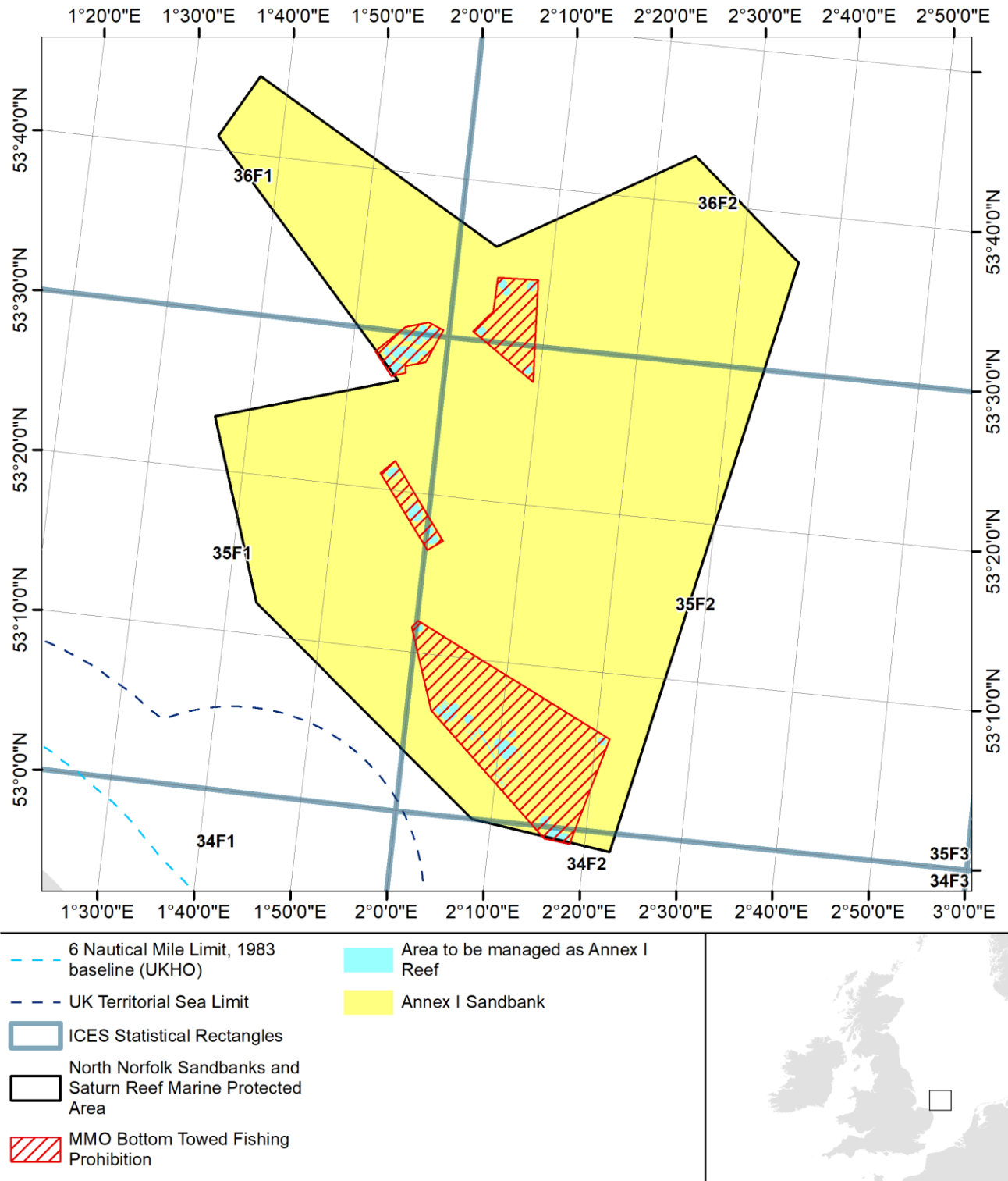
Projection: Lambert Azimuthal Equal Area

Datum: ETRS 1989

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Figure 9. Bottom towed gear management for Hartland Point to Tintagel MPA.



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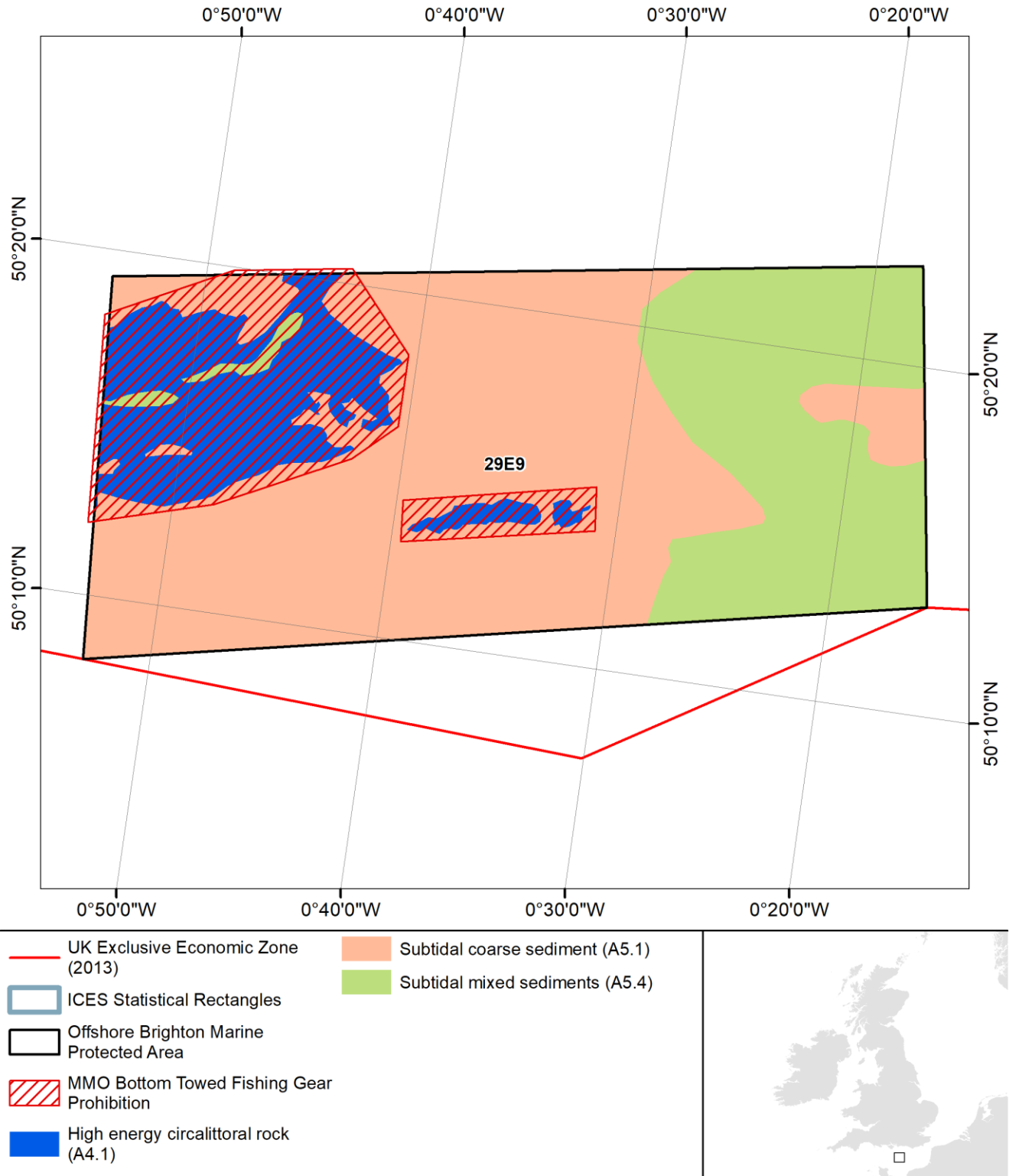
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**Figure 10. Bottom towed gear management for North Norfolk Sandbanks and Saturn Reef MPA.**



# Specified Area for the Prohibition of Bottom Towed Fishing Gear

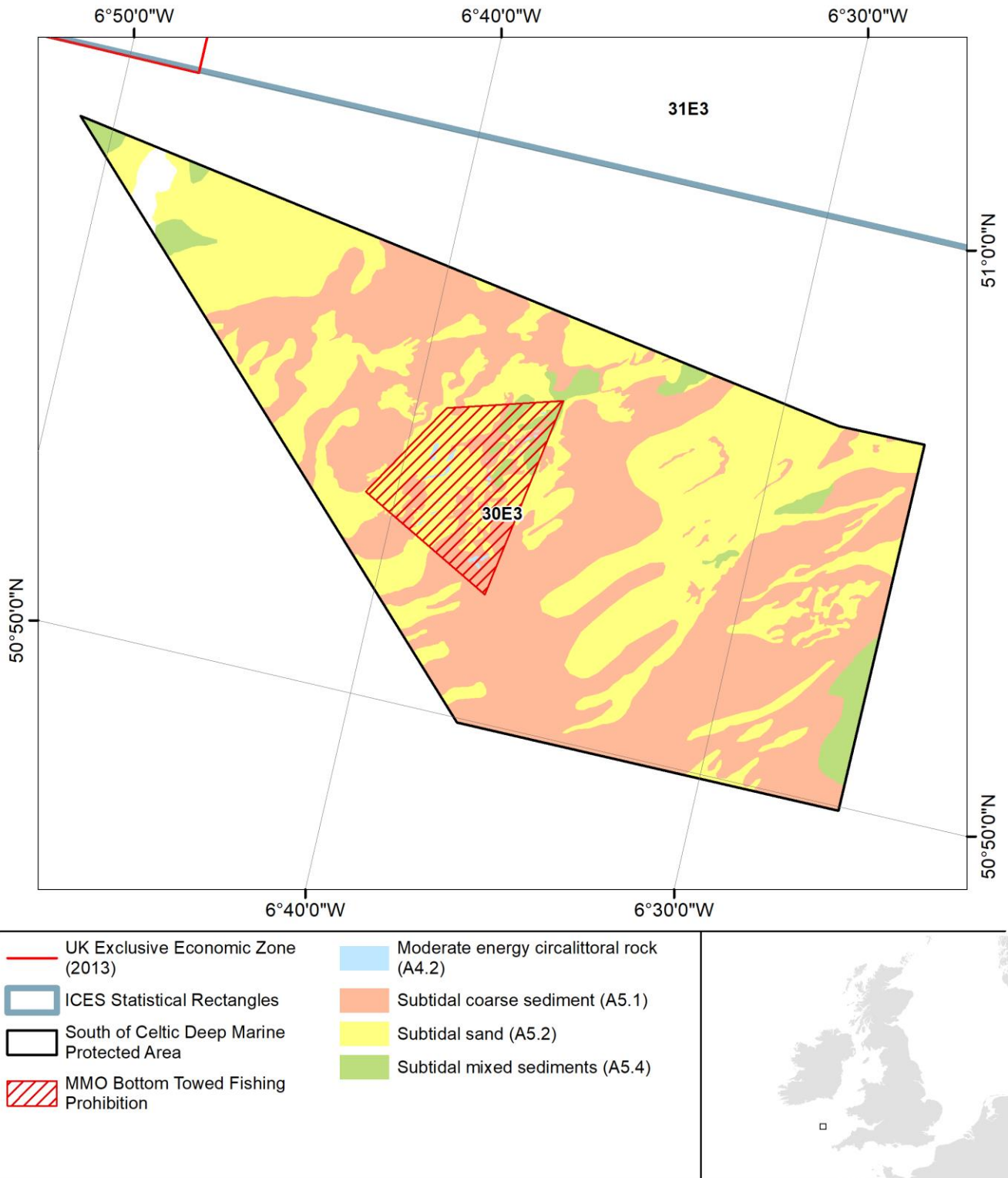
## Offshore Brighton Marine Protected Area



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**Figure 11. Bottom towed gear management for Offshore Brighton MPA.**



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 Datum: ETRS 1989  
 MMO Reference: 10562

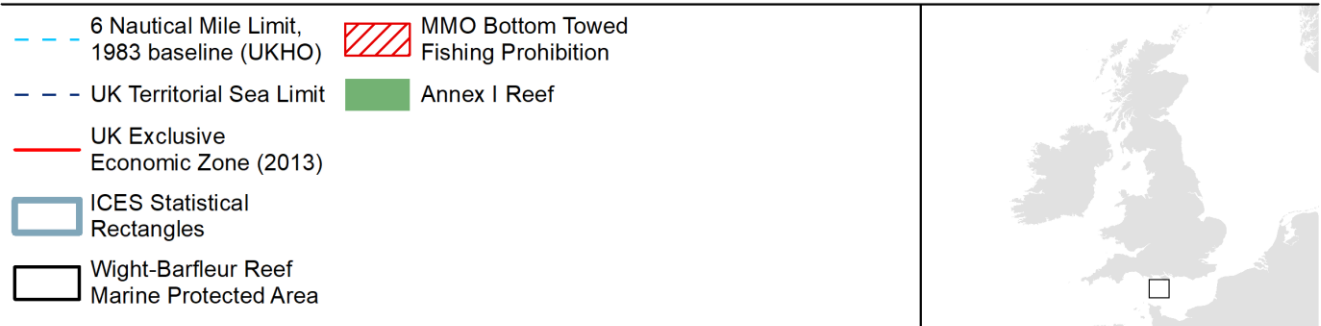
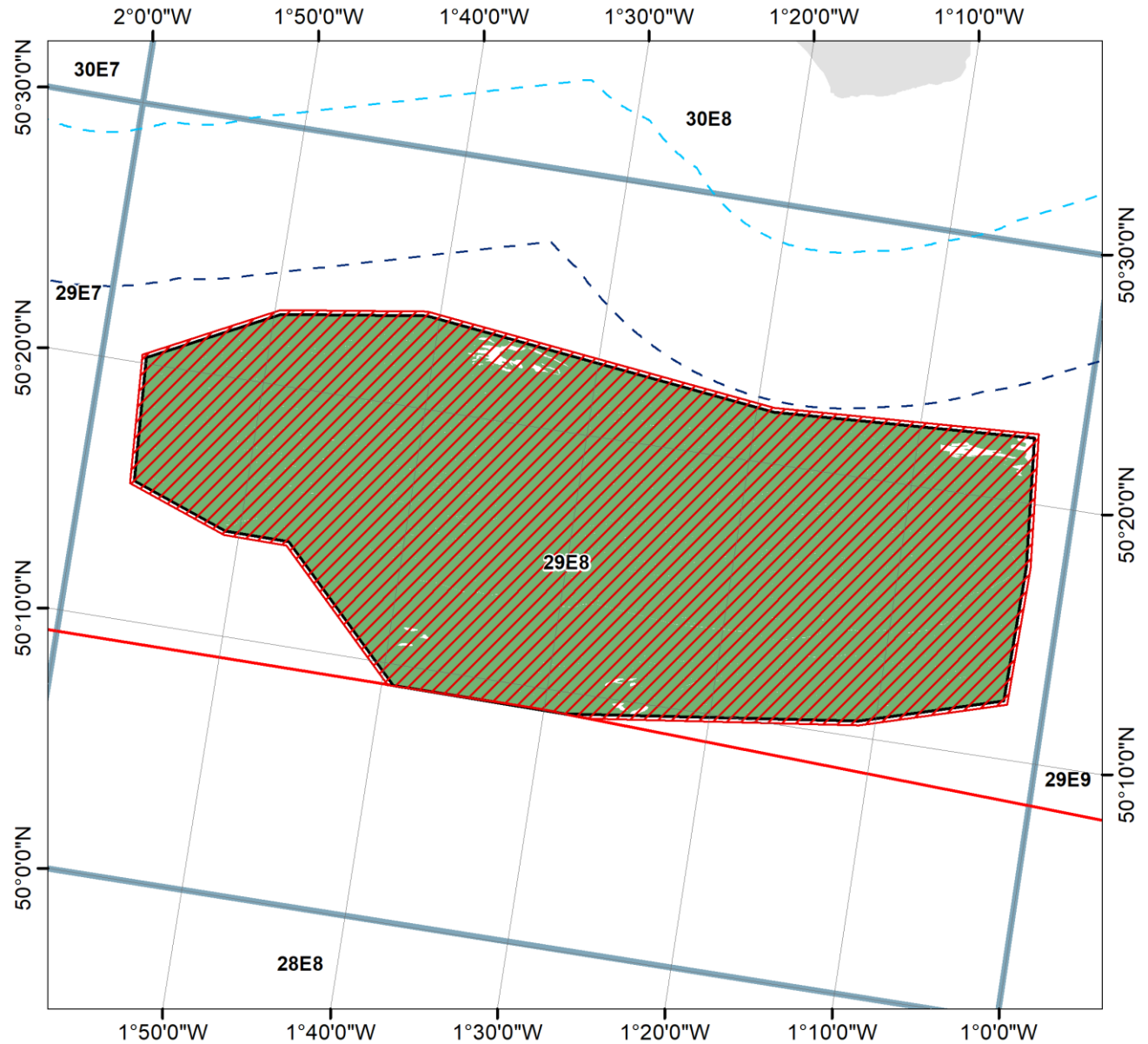
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Figure 12. Bottom towed gear management for South of Celtic Deep MPA.



# Wight-Barfleur Reef Marine Protected Area

## MMO Prohibition of Bottom Towed Fishing



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**Figure 13. Bottom towed gear management for Wight-Barfleur Reef MPA.**