Marine Management Organisation

MMO 2023 Highly Protected Marine Areas Fisheries Assessment

August 2023

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MMO 2023 Highly Protected Marine Areas Fisheries Assessment

Contents

Executive summary

This assessment analyses the impact of fishing activities on the designated features in three highly protected marine areas (HPMAs). The assessment uses the High-Level Conservation Advice for Public Authorities on HPMAs (HLCA)[1] and conservation advice provided by the Joint Nature Conservation Committee (JNCC) and Natural England. The assessment finds that there is a significant risk of ongoing fishing activity at any level hindering the achievement of HPMA conservation objectives. The Marine Management Organisation (MMO) will therefore introduce management measures to prohibit fishing activities throughout the HPMAs.

[1] High-level Conservation Advice for Public Authorities on Highly Protected Marine Areas: hub.jncc.gov.uk/assets/d12633b1-b123-4738-a594-b53c183aee68 (Last accessed on: 20 July 2023).

1 Introduction

In July 2023 the Department for Environment, Food and Rural Affairs (Defra) designated the first three HPMAs in English waters[2]. This assessment considers whether fishing activities are compatible with the conservation objective of these three HPMAs.

The UK Government defines HPMAs as 'areas of the sea that allow the protection and recovery of marine ecosystems by prohibiting extractive, destructive and depositional uses and allowing only non-damaging levels of other activities to the extent permitted by international law'[3].

HPMAs aim to achieve this by setting aside areas of the sea with higher levels of protection than in existing marine protected areas (MPAs).

HPMAs have been designated as marine conservation zones (MCZs) under the Marine and Coastal Access Act 2009 and as such MMO has duties to further their conservation objectives[4].

Where the assessment cannot exclude significant risk of hindering an HPMA conservation objective, management options will be considered. These may include MMO byelaws which will be subject to public consultation and require confirmation from the Secretary of State.

[2] Highly Protected Marine Areas - Policy Information: www.gov.uk/government/publications/highly-protected-marine-areas (Last accessed on: 20 July 2023).

[3] Government response to the Highly Protected Marine Areas (HPMAs) review - GOV.UK (www.gov.uk)

[4] For more information see: http://www.legislation.gov.uk/ukpga/2009/23/section/125.

2 Site information

2.1 Overview

HPMAs have been designated to protect the whole ecosystem within the site boundary. The protected feature of an HPMA is the marine ecosystem of the area which means all marine flora and fauna, all marine habitats and all geological or geomorphological interests, including all abiotic elements and all supporting ecosystem functions and processes, in or on the sea bed, water column and the surface of the sea.

Table 1 details the designated feature and conservation objective for all HPMAs. The conservation objective sets a more ambitious level of protection for HPMAs than that of existing MPAs.

JNCC and Natural England's HLCA advises that within an HPMA:

1. The ecosystem is allowed to fully recover in the absence of damaging activities such that:
    - The ecosystem structure consists of a diverse range of benthic and pelagic communities, habitats and species, including biotic and abiotic components of the ecosystem. These fulfil a variety of functional roles, including supporting key life cycle stages and/or behaviours of marine species.
    - The physical, biological and chemical ecosystem processes and functions proceed unhindered, so that the site realises its full ecological potential to deliver goods and services, including habitats and species considered important to the long-term storage of carbon, and habitats and species important for flood and erosion protection.
    - The ecosystem is resilient to change and stressors.

2. Any ecosystem changes brought about by the process of removing anthropogenic pressures should be considered in the context of a naturally recovering ecosystem.

3. The HPMA supports our understanding of how marine ecosystems change and recover in the absence of impacting activities.

2.2 Designated sites

The first three sites designated as HPMAs in English waters are listed in **Table 1**. The locations of these HPMAs are displayed in **Figure 1**.

Table 1: Designated HPMAs, their designated features, conservation objectives and conservation advice.

HPMA	Designated feature	Conservation objective	Conservation advice
Allonby Bay (**Figure 2**)	The marine ecosystem of the area, which means all marine flora and fauna, all marine habitats and all geological or geomorphological interests, including all abiotic elements and all supporting ecosystem functions and processes, in or on the sea bed, water column and the surface of the sea.	To achieve full recovery of the protected feature, including its structure and functions, features, its qualities and the composition of its characteristic biological communities present within the HPMA and prevent further degradation and damage to the protected feature, subject to natural change.	Natural England Conservation Advice Package - Allonby Bay HPMA[5]
Dolphin Head (**Figure 3**)			JNCC Conservation Advice Package - Dolphin Head HPMA[6]
North East of Farnes Deep (**Figure 4**)			JNCC Conservation Advice Package - North East of Farnes Deep HPMA[7]

Defra have published information detailing background on site geography, designations, features and conservation objectives:

- Defra Policy Paper - Allonby Bay HPMA[8];
- Defra Policy Paper - Dolphin Head HPMA[9]; and
- Defra Policy Paper - North East of Farnes Deep HPMA[10].

[5] Natural England Conservation Advice Package - Allonby Bay HPMA: designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UKEHPMA001 (Last accessed on: 20 July 2023).
[6] JNCC Conservation Advice Package - Dolphin Head HPMA: hub.jncc.gov.uk/assets/9d7cef71-1fef-4e85-a557-218f1ad695c7 (Last accessed on: 20 July 2023).
[7] JNCC Conservation Advice Package - North East of Farnes Deep HPMA: hub.jncc.gov.uk/assets/5c5def7f-e1a0-4a7f-8078-a0ff3050a4fb (Last accessed on: 20 July 2023).
[8] Defra Policy Paper - Allonby Bay HPMA: www.gov.uk/government/publications/highly-protected-marine-areas-allonby-bay (Last accessed on: 20 July 2023).
[9] Defra Policy Paper - Dolphin Head HPMA: www.gov.uk/government/publications/highly-protected-marine-areas-dolphin-head (Last accessed on: 20 July 2023).
[10] Defra Policy Paper - North East of Farnes Deep HPMA: www.gov.uk/government/publications/highly-protected-marine-areas-north-east-of-farnes-deep (Last accessed on: 20 July 2023).

Figure 1: HPMA overview map.

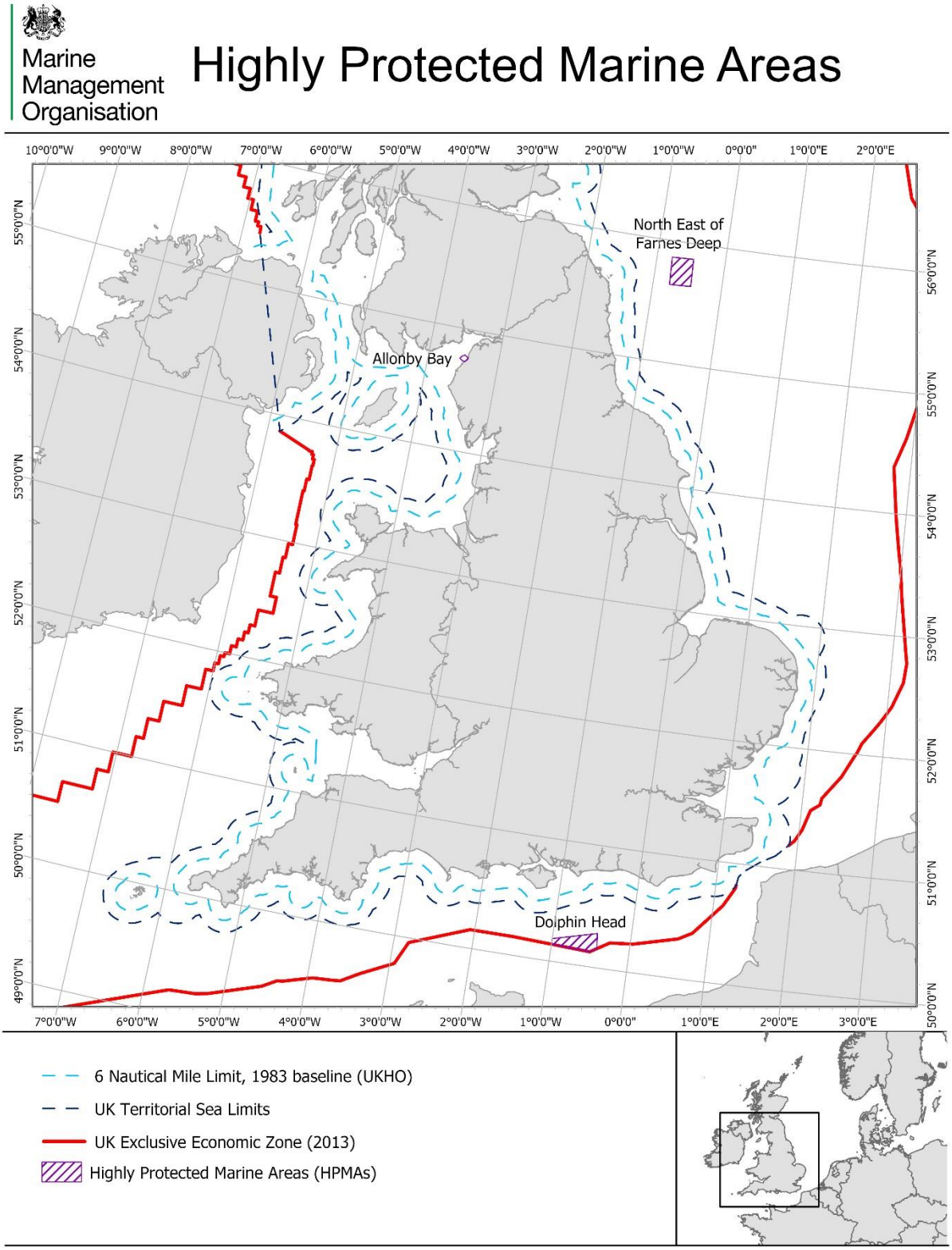


Figure 2: Allonby Bay HPMA.

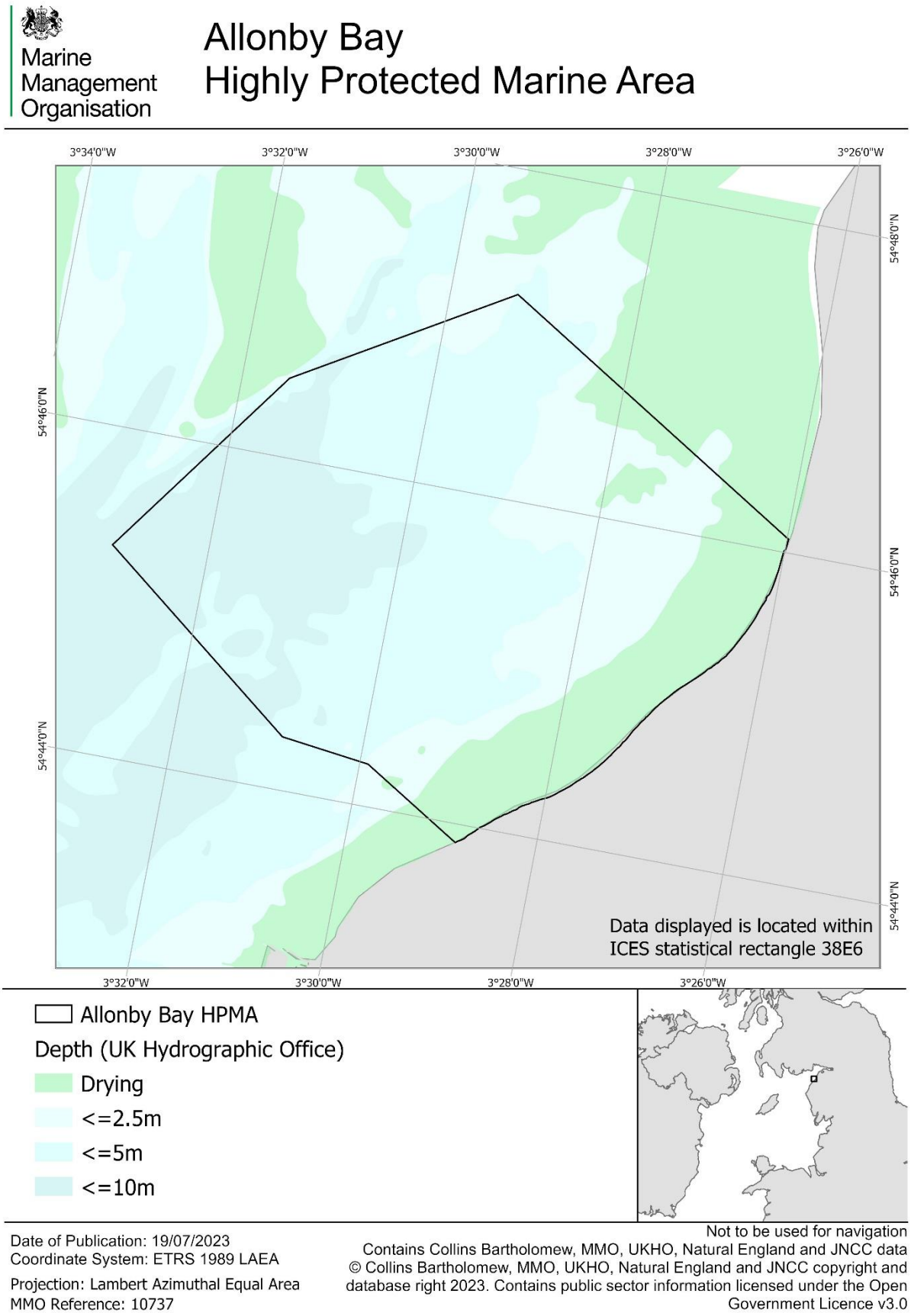


Figure 3: Dolphin Head HPMA.

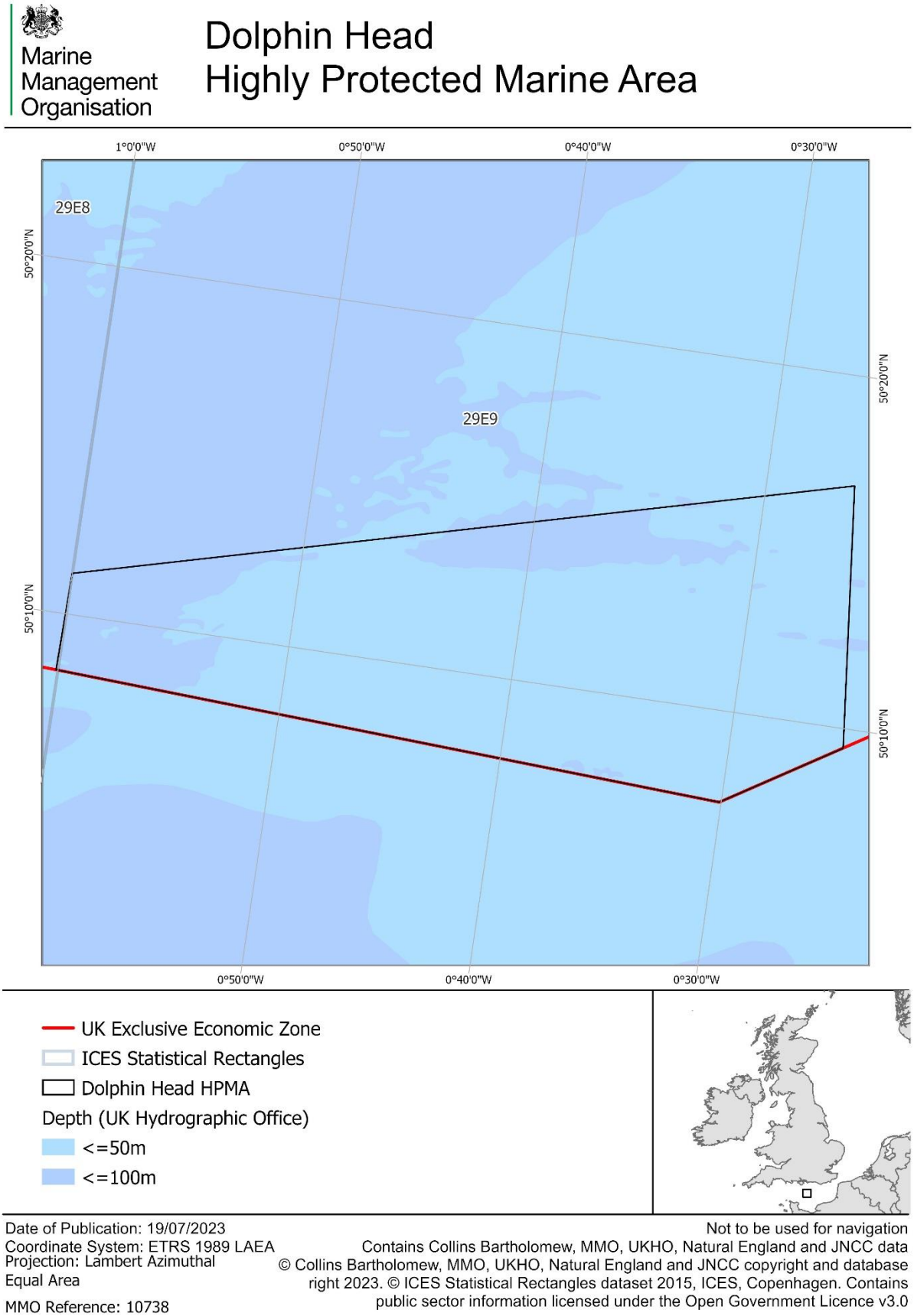


Figure 4: North East of Farnes Deep HPMA.

2.3 Scope of this assessment

Given their ambitious nature, the scope of this assessment considers whether fishing at any level is compatible with HPMA conservation objectives. As such, this assessment considers the impact of both commercial and recreational fishing activities including Hand gathering fishing activities for Allonby Bay which includes an intertidal component.

3 Fishing activities taking place

3.1 Evidence sources

To determine the occurrence of fishing activities MMO used vessel monitoring system (VMS) data and modelled recreational fishing activity data.

3.1.1 Vessel monitoring system

VMS records the location, date, time, speed, and course of commercial fishing vessels over 12 m in length. Fishing gear information is linked to the VMS data by matching vessel logbook information or using the fleet register.

This assessment includes static maps (**Figure 5** to **Figure 7**) displaying VMS density information for the three HPMAs. Each map shows VMS total cumulative report density data of UK and non-UK vessels for the years 2012 to 2021, aggregated to squares of 500 m by 500 m. Only fishing reports (those where the speed is reported at 0.1 to 6 knots) are included. The data shown is spatially restricted to the extent of the three HPMAs plus a buffer of 15 km. Data has been generated for all fishing gears combined.

The HPMA VMS Report Density WebApp (2012 to 2021)[11] has also been produced displaying VMS density information for the three HPMAs. These similarly show VMS total cumulative report density data of UK and non-UK vessels for the years 2012 to 2021, aggregated to squares of 500 m by 500 m with only fishing reports included. The data in the WebApp is also spatially restricted to the extent of the three HPMAs plus a buffer of 15 km. Separate data has been generated for all gears combined and each aggregated gear group – bottom towed gear, static gear and midwater gear.

Confidence in VMS is high for describing activity relating to larger vessels (over 12 m), but it does not describe activity of smaller vessels.

There are assumptions in the processing that a speed of 0.1 to 6 knots is ‘fishing speed’. This may therefore include vessels travelling at these speeds, but which are not fishing,

[11] HPMA VMS Report Density WebApp (2012 to 2021): defra.maps.arcgis.com/apps/dashboards/5b0fef83412346cd8caf3456b870aeb3 (Last accessed on: 20 July 2023).

and exclude any fishing taking place above 6 knots. Therefore, this may over or under-estimate fishing activity.

VMS data log vessel movement and thus can act as a good proxy for mobile gear effort. However, it is more challenging to link VMS data to static gear effort (for example amount of gear, soak time etc).

3.1.2 Recreational fishing activity

Data regarding recreational fishing activity is relatively limited. Data from the MMO project 'Modelling marine recreation potential in England'[12] has been used to determine the presence of recreational fishing activity. The project developed a computer model to map areas of marine recreation potential in English waters, to support current knowledge and the existing evidence database on marine recreation activity locations.

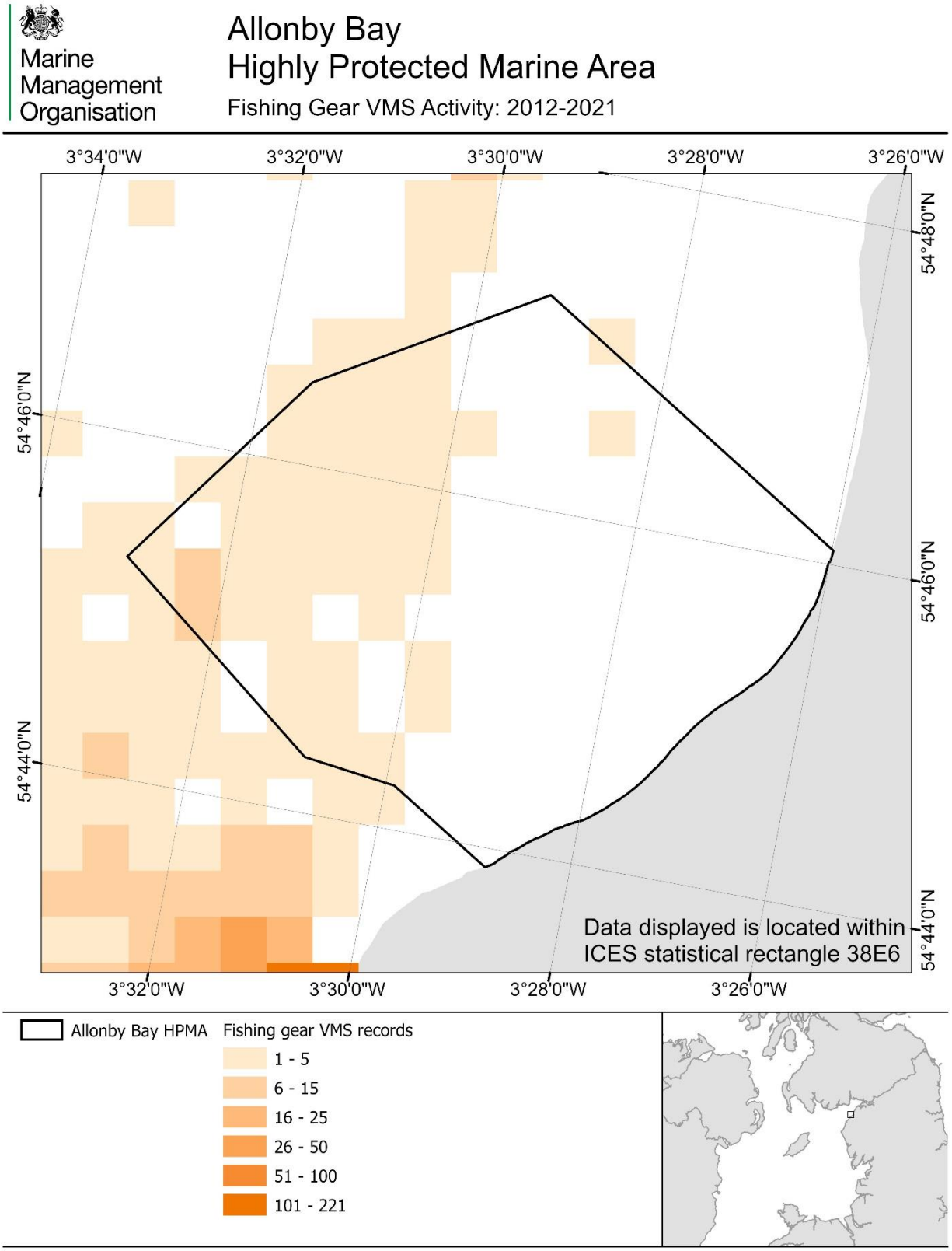
The approach and principles of the model were broadly supported by the recreation community.

Static maps have been included which display the potential for shore angling

Figure 8), angling activity from vessels (**Figure 9** to **Figure 11**) and scuba diving (**Figure 12** to **Figure 14**). It should be noted however that while there may be the potential for scuba diving activity, this does not necessarily equate to potential for fishing activity via scuba diving. Additionally, other recreational fishing activities such as spear fishing or potting little data is not included her due to the scarcity of data available.

[12] Modelling marine recreation potential in England: www.gov.uk/government/publications/modelling-marine-recreation-potential-in-england-mmo-1064 (Last accessed on: 20 July 2023).

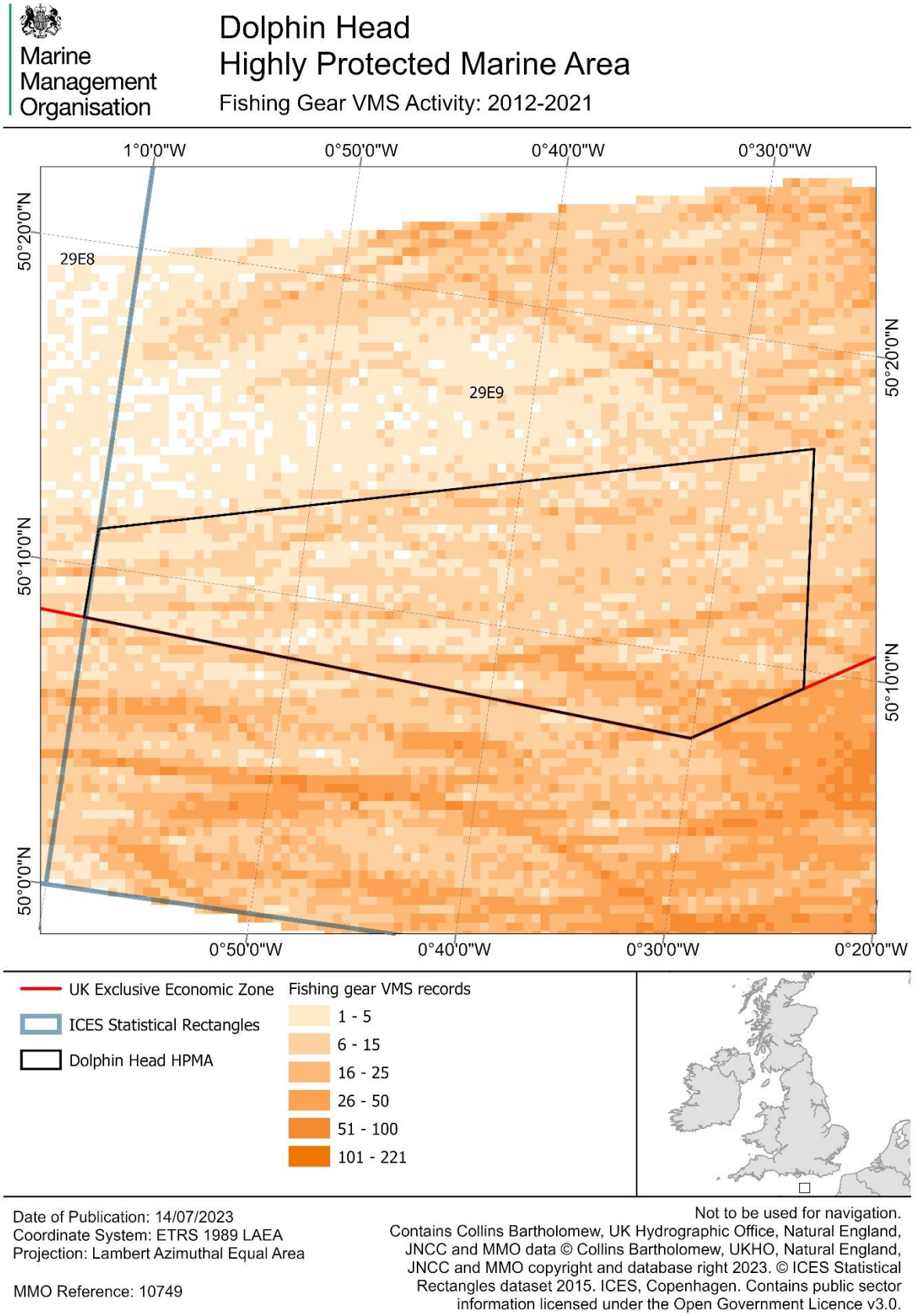
Figure 5: Allonby Bay HPMA VMS Fishing activity (from 2012 to 2021).



Date of Publication: 14/07/2023
Coordinate System: ETRS 1989 LAEA
Projection: Lambert Azimuthal Equal Area

MMO Reference: 10749

Figure 6: Dolphin Head HPMA VMS Fishing activity (from 2012 to 2021).



Date of Publication: 14/07/2023
Coordinate System: ETRS 1989 LAEA
Projection: Lambert Azimuthal Equal Area

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Figure 7: North East of Farnes Deep HPMA VMS Fishing activity (from 2012 to 2021).

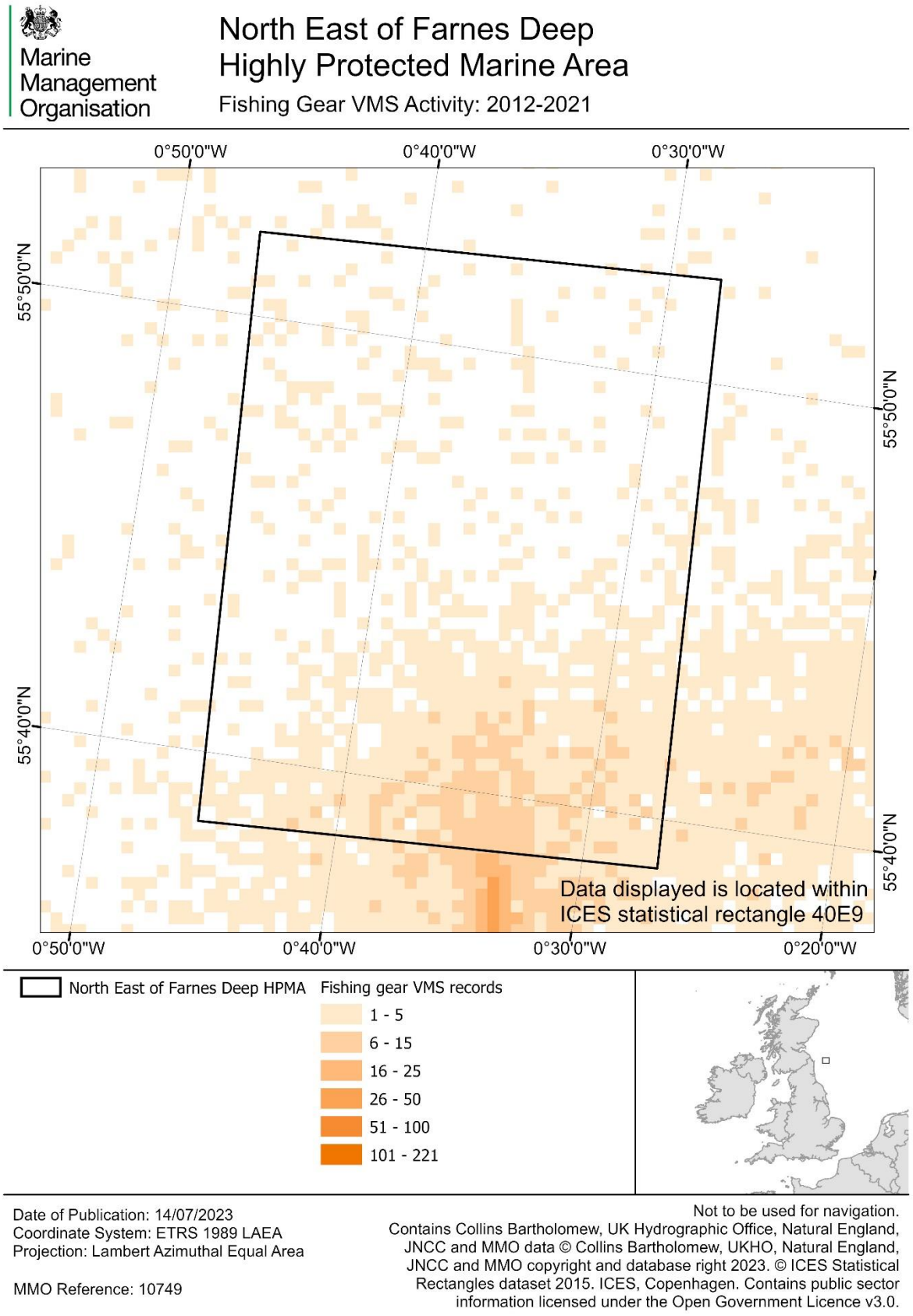


Figure 8: Allonby Bay HPMA recreational shore angling potential.

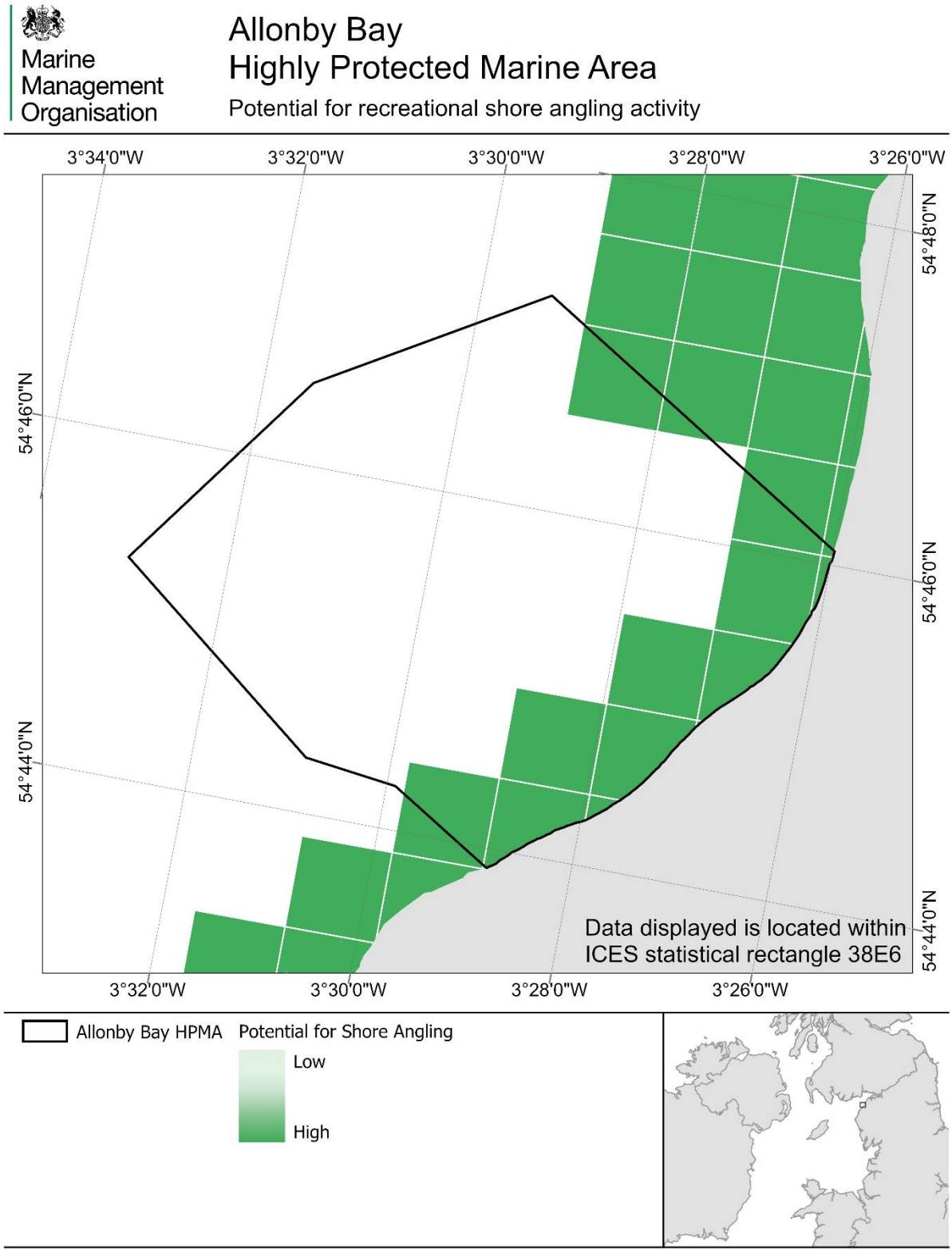


Figure 9: Allonby Bay HPMA recreational vessel angling potential.

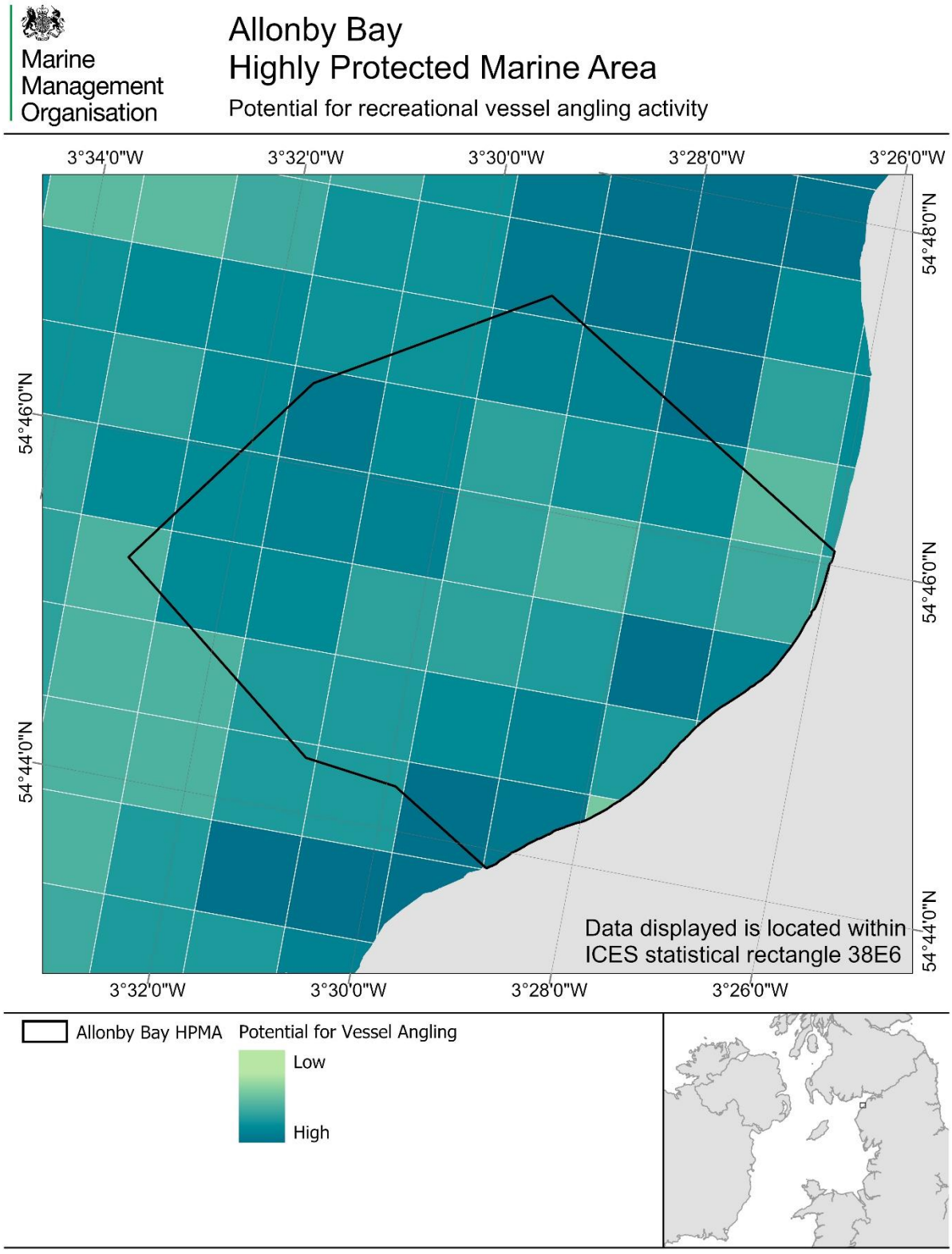
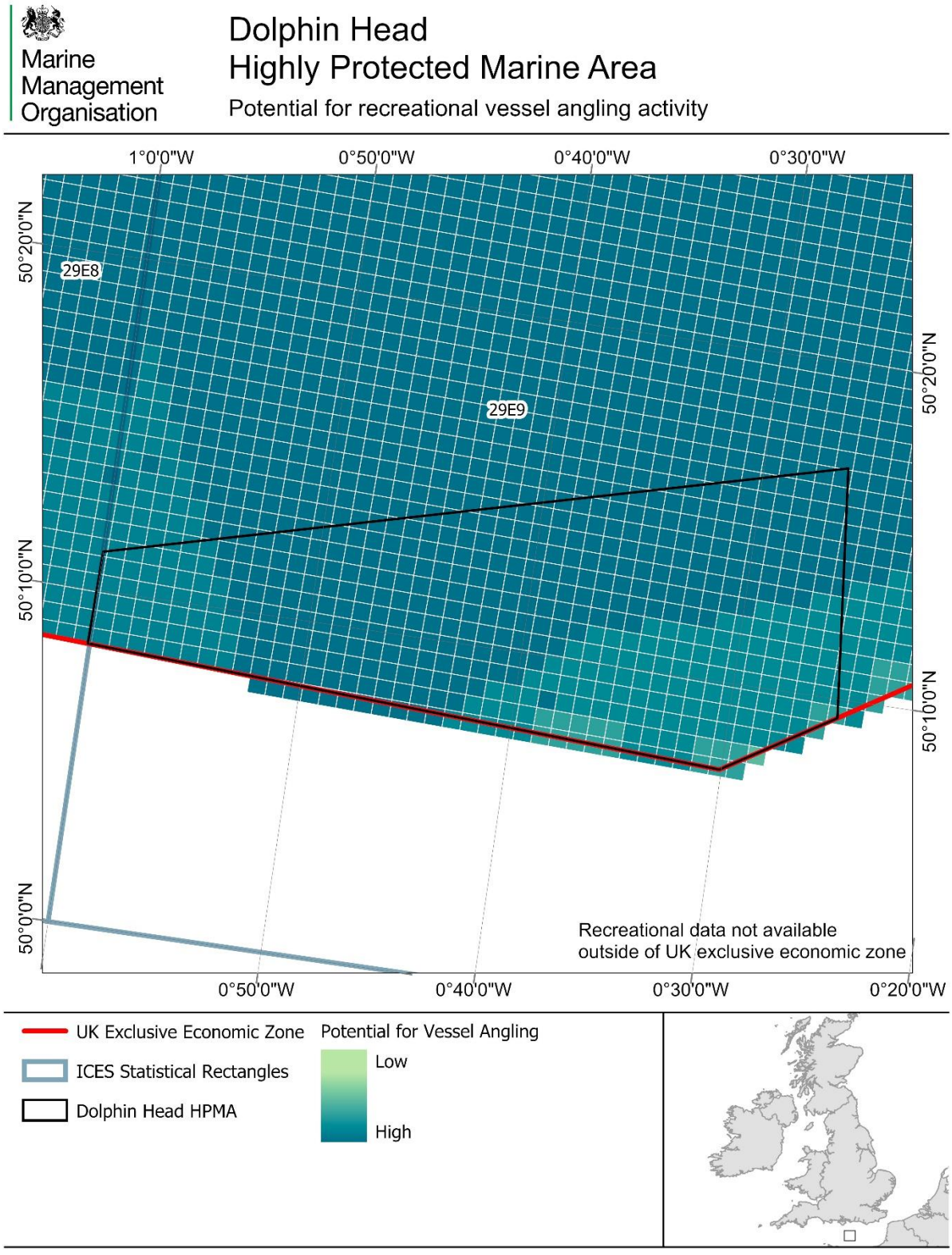


Figure 10: Dolphin Head HPMA VMS recreational vessel angling potential.



Date of Publication: 19/07/2023
Coordinate System: ETRS 1989 LAEA
Projection: Lambert Azimuthal Equal Area
MMO Reference: 10750

Figure 11: North East of Farnes Deep HPMA recreational vessel angling potential.

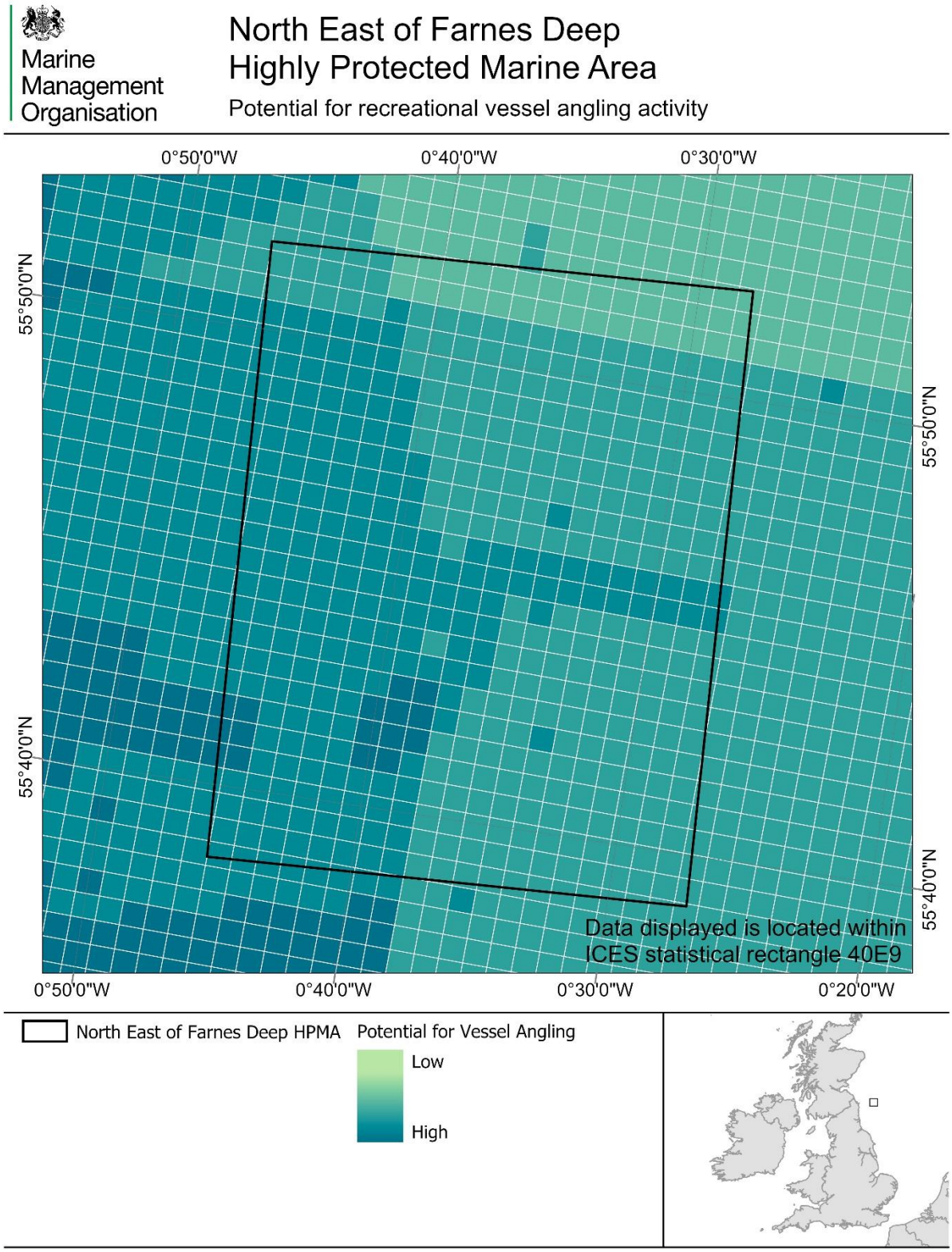


Figure 12: Allonby Bay HPMA Scuba diving potential.

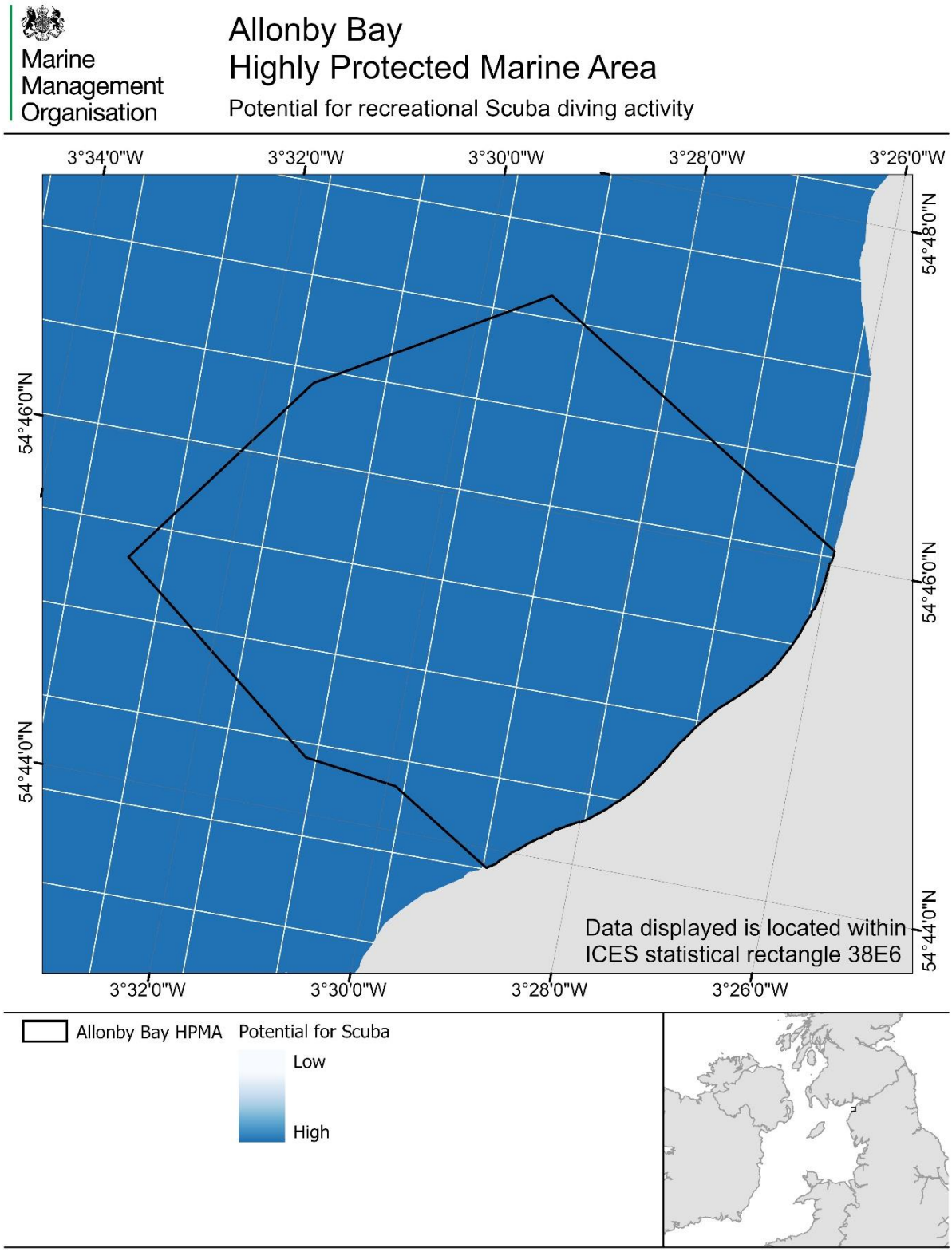


Figure 13: Dolphin Head HPMA Scuba diving potential.

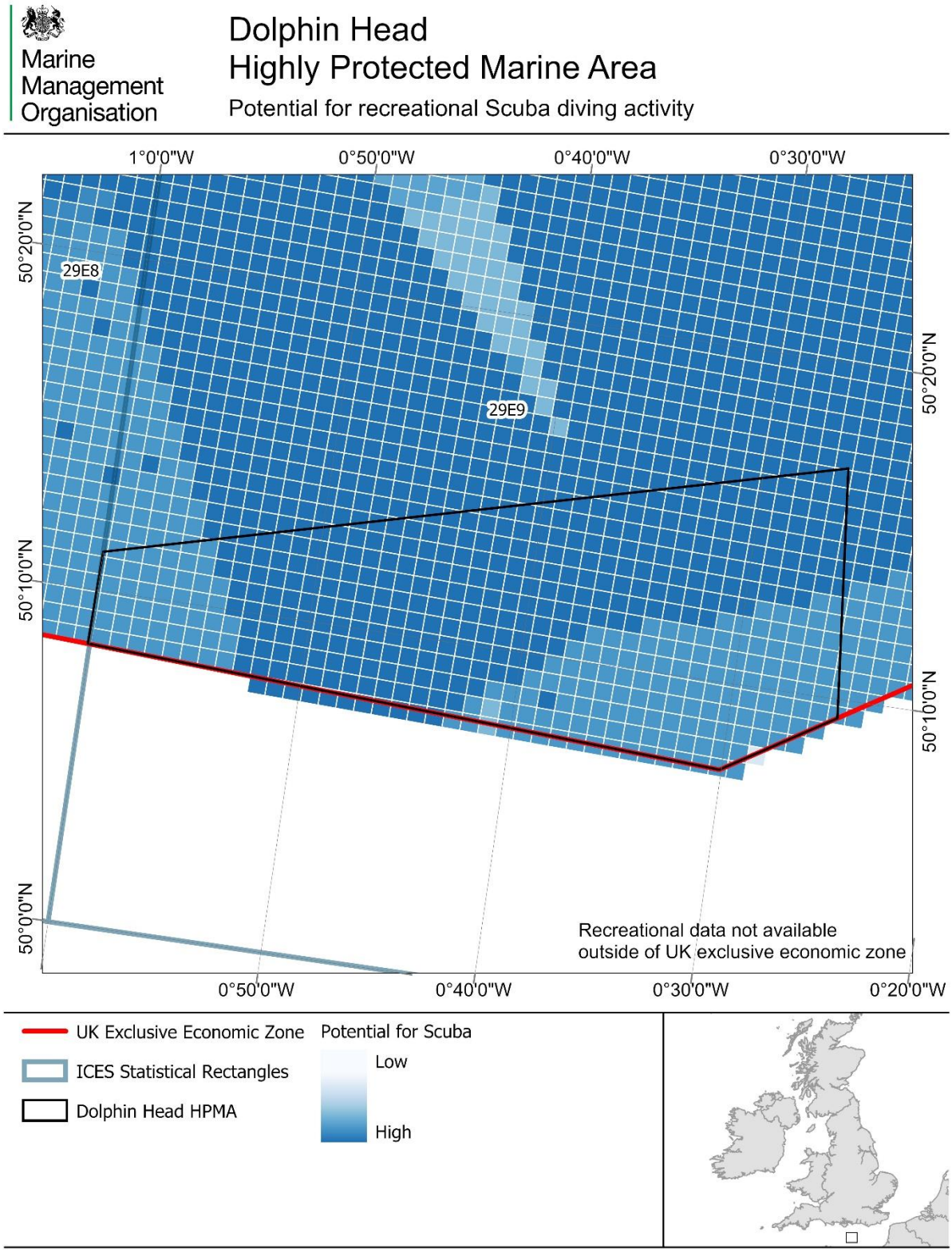
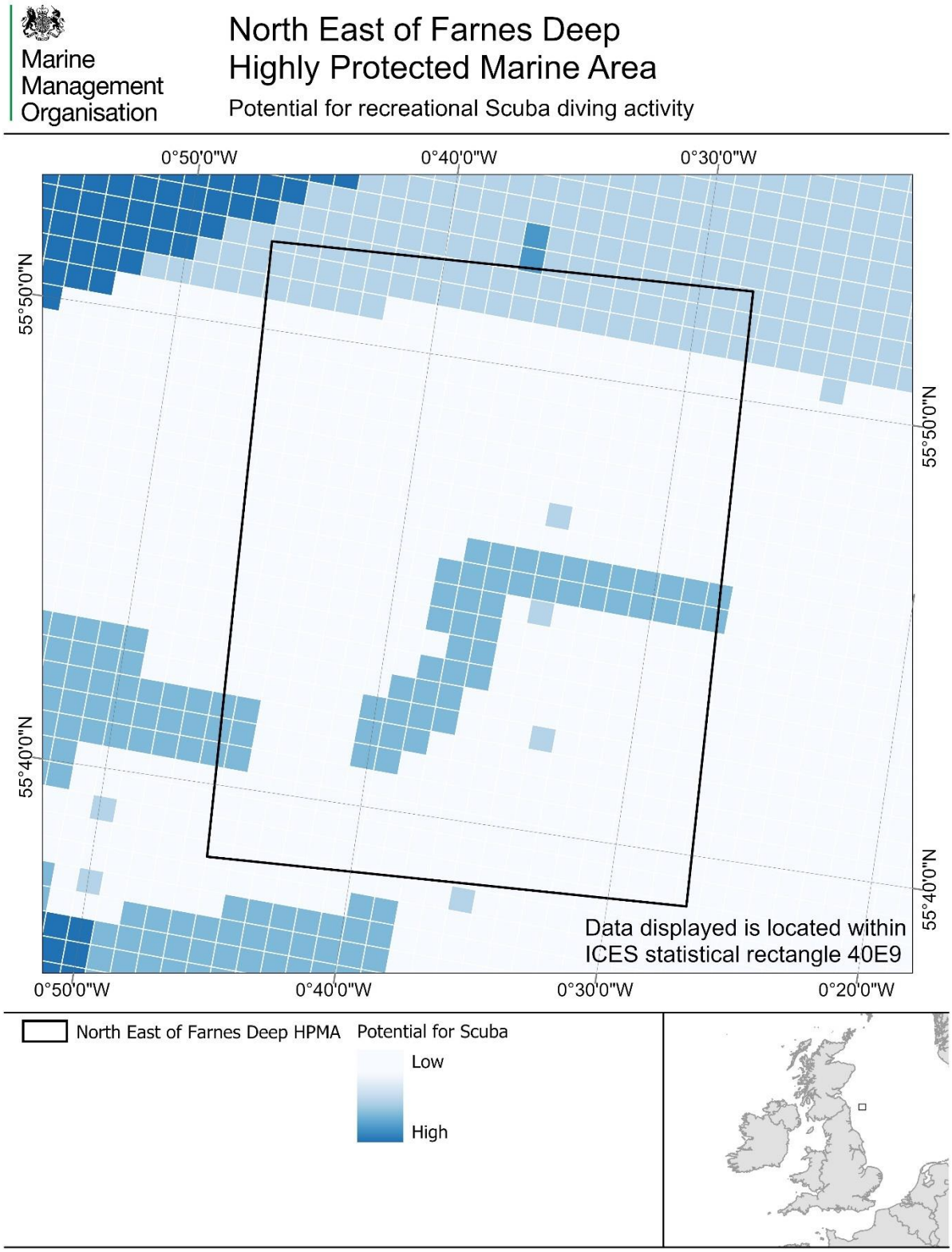


Figure 14: North East of Farnes Deep HPMA Scuba diving potential.



4 Pressures resulting from fishing

JNCC and Natural England have identified fishing as an activity likely to hinder the conservation objective of an HPMA and should be avoided unless the regulators' and public authorities' MCZ assessment process determines otherwise[1].

This assessment was carried out in a manner that is consistent with the 'capable of affecting (other than insignificantly)' and 'significant risk of the act hindering the achievement of the conservation objectives' tests set out in section 126 of the Marine and Coastal Access Act 2009[4].

JNCC and Natural England advise that all the pressures relating to fishing activity are considered in the assessment. The MMO approach has been to use the JNCC Pressures Activities Database[13] and Natural England's Advice on achieving the conservation objective of the HPMA[5] to initially identify and assess the key, medium to high risk fishing pressures considered most likely to affect the designated feature (**Table 2**). Any activities that are deemed not to require management following assessment of these key pressures would be considered further by assessing all other pressures associated with the activities.

This assessment is concerned with the physical pressures of fishing activities. Non-physical disturbance of mobile species such as marine birds and marine mammals while they are within the site boundary from fishing vessel presence is not considered here. The impact of these pressures will be similar to those of other, non-fishing, vessels and will therefore be considered together in a future assessment concerning the impacts of marine non licensable activities on HPMAs.

Consideration of a pressure on the designated feature 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.

[13] JNCC Pressures Activities Database: hub.jncc.gov.uk/assets/97447f16-9f38-49ff-a3af-56d437fd1951 (Last accessed on: 20 July 2023).

Table 2: Summary of key pressures from fishing activities likely to hinder the conservation objective of an HPMA.

	Recreational and commercial fishing activities listed in the HLCA								
Key pressures impacting the designated feature of HPMAs	**Anchored nets and lines**	**Electrofishing**	**Traps**	**Midwater fishing (or fishing activities that do not interact with the seabed)**	**Demersal trawl**	**Demersal seines**	**Dredges (including hydraulic)**	**Shore-based fishing activities**	**Diving**
Abrasion or disturbance of the substrate on the surface of the seabed	X	X	X		X	X	X	X	
Penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion		X			X	X	X	X	
Removal of non-target species	X	X	X	X	X	X	X	X	
Removal of target species	X	X	X	X	X	X	X	X	X
Smothering and siltation rate changes (light)		X			X	X	X		

4.1 Fisheries access and existing management

Non-UK vessels can operate within Dolphin Head and North East of Farnes Deep HPMAs, provided that they have a licence issued by the UK to do so. Nationalities of vessels which have likely fished within the HPMAs include UK, Belgium, Germany, Denmark, France, Ireland, Lithuania, the Netherlands, Norway and Sweden. VMS records indicate that French, Danish and Dutch vessels are most active in the two sites, albeit with Danish activity only significant in North East of Farnes Deep HPMA.

There are no specific fisheries management measures currently in place to protect the designated feature of HPMAs. Dolphin Head HPMA overlaps with Offshore Brighton MCZ and MMO has proposed prohibition of bottom towed gears in specified areas of the MCZ to protect its sensitive rock features. If management measures for Dolphin Head HPMA are required, these will take precedence over management measures in existing sites such as Offshore Brighton MCZ.

5 Assessment of key pressures from fishing activities

To assess the key pressures from fishing activities MMO has used the best available evidence on the impacts of different fishing gears on the HPMA designated feature:

- Natural England's Advice on achieving the conservation objective of the HPMA[5],
- JNCC's Pressures Activities Database[13], and
- JNCC and Natural England conservation advice (**Table 1**)

As detailed in **Table 1**, HPMAs have one designated feature. However, elements of this feature have been referred to separately as appropriate in the assessment of key pressures below.

5.1 Removal of non-target species and removal of target species

The pressures 'removal of non-target' and 'removal of target species' have been consolidated due to the similar nature of their impacts on the designated feature.

Fishing activities causing the removal of species are listed in **Table 2**.

These pressures result from the direct removal of commercially valuable species and from incidental bycatch.

The removal of species pressure caused by fishing has biological impacts to species and supporting ecosystem features. Removing both predator and prey species may result in significant ecological consequences to populations, community structure and the marine food web (Alverson *et al.*, 1994; Kaiser *et al.*, 2003)).

Figure 5 to **Figure 14** show potential fishing activities taking place in HPMAs. As detailed in **Table 2**, all fishing activities result in the removal of target species and (with the exception of diving) non-target species. All fishing activities are therefore likely to

significantly impact the designated feature through removal of flora and fauna and the resulting consequences for ecosystem function and processes.

The impact of these pressures on the designated feature will vary according to activity and fishing intensity. MMO considers any level of removal of species (both target and non-target) by fishing gears is not compatible with achieving the HPMA conservation objective specifically with regard to full natural ecosystem recovery of features and composition of characteristic biological communities, and prevention of further degradation to the marine ecosystem.

Therefore MMO concludes that there is a significant risk of removal of species (both target and non-target) by fishing at any level hindering the achievement of HPMA conservation objectives.

5.2 Abrasion or disturbance of the substrate on the surface of the seabed, and penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion

The pressures ‘abrasion or disturbance of the substrate on the surface of the seabed’ and ‘penetration and/or disturbance of the substrate below the surface of the seabed, including abrasion’ have been consolidated due to the similar nature of their impacts on the designated feature.

Fishing activities causing abrasion and penetration and/or disturbance of the substrate on or below the surface of the seabed are listed in **Table 2.**

These pressures result where fishing gear makes contact with the seafloor, for example during setting and retrieval of traps, movement of gear during rough weather and towing of bottom towed fishing gear.

The ‘abrasion’ and ‘penetration’ pressures caused by fishing gears have both biological and physical impacts to seabed features. Physical impacts range from the creation of furrows and berms in sediment (Nilsson and Rosenberg, 2003; Løkkeborg, 2005; Polet and Depestele, 2010; Grieve, Brady and Polet, 2014), to the flattening of bottom features such as ripples and the homogenisation of sediments eliminating natural features (Collie *et al.*, 2000; Kaiser *et al.*, 2002; Løkkeborg, 2005; Sewell and Hiscock, 2005; Beukers-Stewart and Beukers-Stewart, 2009; Craven, Brand and Stewart, 2013).

Biological impacts include damage and mortality to flora and fauna on and in the seabed via surface and subsurface abrasion and penetration (due to collision and crushing as animals pass under the gear and/or the initial encounter with the gear), as well as long term shifts in biological communities towards smaller, short-lived, opportunistic species (Schratzberger, Dinmore and Jennings, 2002; Queirós *et al.*, 2006; Josefson *et al.*, 2018; Rijnsdorp *et al.*, 2018).

Figure 5 to **Figure 14** show potential fishing activities capable of causing penetration and or abrasion taking place in each HPMA. These fishing activities are likely to significantly impact the designated feature through alteration, damage or destruction to flora, fauna and the seabed with implications for ecosystem function and processes.

The impact of these pressures on the designated feature will vary according to activity and fishing intensity. MMO considers that any level of physical disturbance from bottom towed fishing gear (such as demersal seines, trawls and dredges) to the seabed is unlikely to be compatible with achieving the HPMA conservation objective. Specifically with regard to full natural ecosystem recovery of the structure and functions, features, qualities, and prevention of further degradation and damage to the marine ecosystem the composition of its characteristic biological communities.

Regarding other fishing gears (such as anchored nets and lines and traps), physical and/or biological damage is likely to have a lesser impact than that of bottom towed gear. It is currently unclear whether use of these gears would be sufficient to hinder HPMA conservation objectives. However, non-bottom towed gears require management due to the impact of species removal (as detailed in **section 5.1** above) and this will have the associated effect of also preventing potential impacts from abrasion and penetration.

Therefore MMO concludes that there is a significant risk of abrasion, penetration and/or disturbance by fishing at any level hindering the achievement of HPMA conservation objectives.

5.3 Smothering and siltation rate changes

Fishing activities causing ‘smothering and siltation rate changes’ are listed in **Table 2.**

This pressure results from physical disturbance of the sediment when fishing gear connects with the seabed, causing the top layer of the sediment to mix with the surrounding water, leading to entrainment and suspension of the substrate behind and around the gear components and subsequent siltation. Here, this pressure is considered for bottom towed fishing and electrofishing.

The ‘smothering and siltation rate changes’ pressure caused by fishing has biological impacts to species and supporting ecosystem features. Sediment remobilisation and deposition can affect the settlement, feeding, and survival of biota through smothering of feeding and respiratory organs (Kaiser *et al.*, 2003).

Re-suspension and mixing of sediment, as well as mortality of infauna by bottom towed gear, will affect the natural conditions of the ecosystem (Morys, Brüchert and Bradshaw, 2021) altering biogeochemical processes within sediment, the consequences of which can lead to immediate declines in benthic community metabolism (Tiano *et al.*, 2019).

Figure 5 to **Figure 14** show potential fishing activities capable of causing smothering and siltation taking place in each HPMA. These fishing activities are likely to significantly

impact the designated feature through impacts to flora and fauna, with implications for ecosystem function and processes.

The impact of this pressure on the designated feature will vary according to activity and fishing intensity. MMO considers any level of smothering and siltation rate change to not be compatible with achieving HPMA conservation objectives, specifically with regard to full natural ecosystem recovery of features and composition of characteristic biological communities, and prevention of further degradation and damage to the marine ecosystem.

Therefore MMO concludes that there is a significant risk of smothering and siltation rate changes by fishing at any level hindering the achievement of HPMA conservation objectives.

5.4 Assessment conclusion

A number of pressures have been identified as being capable of affecting HPMA designated features, including pressures associated with the removal of species and the impact of gears on the seabed. These pressures may result in a significant risk of hindering the achievement of HPMA conservation objectives.

This conclusion applies to all fishing activities and therefore further assessment of additional pressures associated with these fishing activities will not be carried out as part of this assessment.

Management measures will therefore be implemented for all commercial and recreational fishing activities. **Section 6** contains further details of these measures.

6 Conclusion and proposed management

This assessment concludes that there is a significant risk of the pressures associated with fishing at any level (including the removal of species and impact of gear on the seabed) hindering the conservation objective of the HPMAs.

Due to this conclusion, management is being proposed to remove fishing activity and its associated pressures from the HPMA based on the impact of fishing alone. Therefore, an in-combination assessment of the cumulative impacts of fishing and other activities is not required.

To ensure that fishing activities do not result in a significant risk of hindering the conservation objective of the HPMA, MMO will implement a byelaw to prohibit fishing throughout the three HPMAs via the Highly Protected Marine Areas Fishing Byelaw 2023.

MMO has followed Natural England and JNCC guidance (JNCC, 2012; Natural England and JNCC, 2023) regarding the application of a minimum management buffer zone to ensure appropriate protection of the designated feature of HPMAs from the impacts of fishing activities. This follows a gear warp length to water depth ratio as below in **Table 3**.

Table 3: Gear warp length: water depth ratio and buffer zone.

Water depth	Ratio warp length to depth	Buffer
Shallow waters (≤ 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 outside HPMA boundaries.

Due to the greater precaution required for HPMAs, JNCC and Natural England have also advised a minimum buffer requirement of 100 m to prevent sedimentation impacts within shallower HPMAs such as Allonby Bay. Where the depth is such that the existing guidance (**Table 3**) results in a buffer greater than 100 m, the existing buffer guidance can be used. In some cases, the spatial extent of the buffer will extend marginally beyond the minimum calculated for simplicity and in order to facilitate compliance with the management measures.

7 Review of this assessment

MMO will review this assessment every five years, or earlier if significant new information is received.

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 HPMAs. This plan will be developed in line with the MMO Monitoring and Control Plan framework.

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