Marine Management Organisation

MMO Call for Evidence on Stage 2 Draft MPA Fisheries Assessment

May 2022

...ambitious for our seas and coasts

Contents

Executive Summary

This assessment analyses the impact of bottom towed fishing gear on certain features in 13 marine protected areas (MPA), specifically rock, reef and related features. The assessment covers the evidence considered and a general analysis of that evidence. Site specific assessments for the 13 MPAs are also presented. The assessment finds that the use of bottom towed gears poses considerable risks to the condition of the features considered.

1. Introduction

This document forms part of Stage 2 of MMO's work to meet the government's ambition that appropriate fisheries management measures are in place for all offshore MPAs in English waters by the end of 2024. MMO is responsible for the assessment and management of fishing activity in MPAs offshore of 6 nautical miles (nm), and Inshore Fisheries and Conservation Authorities (IFCAs) are responsible for MPAs inshore of 6 nm.

2. Overview of MPA Assessment Approach

2.1. Why this assessment is required

In order to meet the government's ambition that appropriate fisheries management measures are in place for all offshore MPAs by the end of 2024, it is necessary to understand the impact of fishing in these MPAs. This assessment analyses the impact of bottom towed gear on certain features of 13 MPAs, specifically rock, reef and related features.

These MPAs have been selected for Stage 2 as they contain rock, reef or related features, which are amongst the most sensitive features to the impacts of bottom towed gear fishing.

2.2. Assessment methodology

2.2.1. Introduction

The specific features of the MPAs which are considered in this assessment are set out in Table 1.

For the purposes of this assessment MMO has classified bedrock reef and stony reef within SACs as 'Annex I reef: rocky'. Rocky reef is recognised as areas where animal and plant communities develop on rock (bedrock) or stable boulders and cobbles (stony). Biogenic reef is classified separately and is recognised as areas where structure is created by the animals themselves. Please see the site-specific assessment under section 3 'MPA site level assessments' for further information on the type of reef present.

Locations of these MPAs in English waters are displayed in Figure 1, and UK bottom towed fishing effort for vessels ≥ 15 m in 2019 is displayed in Figure 2. However, please note that Figure 2 does not include VMS data for vessels below 15 m in length.

Table 1: MPAs and features considered.

MPA	Features
Cape Bank Marine Conservation Zone (MCZ)	High energy circalittoral rock Moderate energy circalittoral rock
East of Haig Fras MCZ	High energy circalittoral rock Moderate energy circalittoral rock
Farnes East MCZ	Moderate energy circalittoral rock
Foreland MCZ	High energy circalittoral rock Moderate energy circalittoral rock
Goodwin Sands MCZ	Moderate energy circalittoral rock Ross worm (*Sabellaria spinulosa)* reefs
Haig Fras Special Area of Conservation (SAC)	Annex I reef: rocky
Haisborough, Hammond and Winterton SAC	Annex I reef: biogenic
Hartland Point to Tintagel MCZ	High energy circalittoral rock Moderate energy circalittoral rock Fragile sponge and anthozoan communities on subtidal rocky habitats Pink sea fans (*Eunicella verrucosa)*
Land's End and Cape Bank SAC	Annex I reef: rocky
North Norfolk Sandbanks and Saturn Reef SAC	Annex I reef: biogenic
Offshore Brighton MCZ	High energy circalittoral rock
South of Celtic Deep MCZ	Moderate energy circalittoral rock
Wight-Barfleur Reef SAC	Annex I reef: rocky

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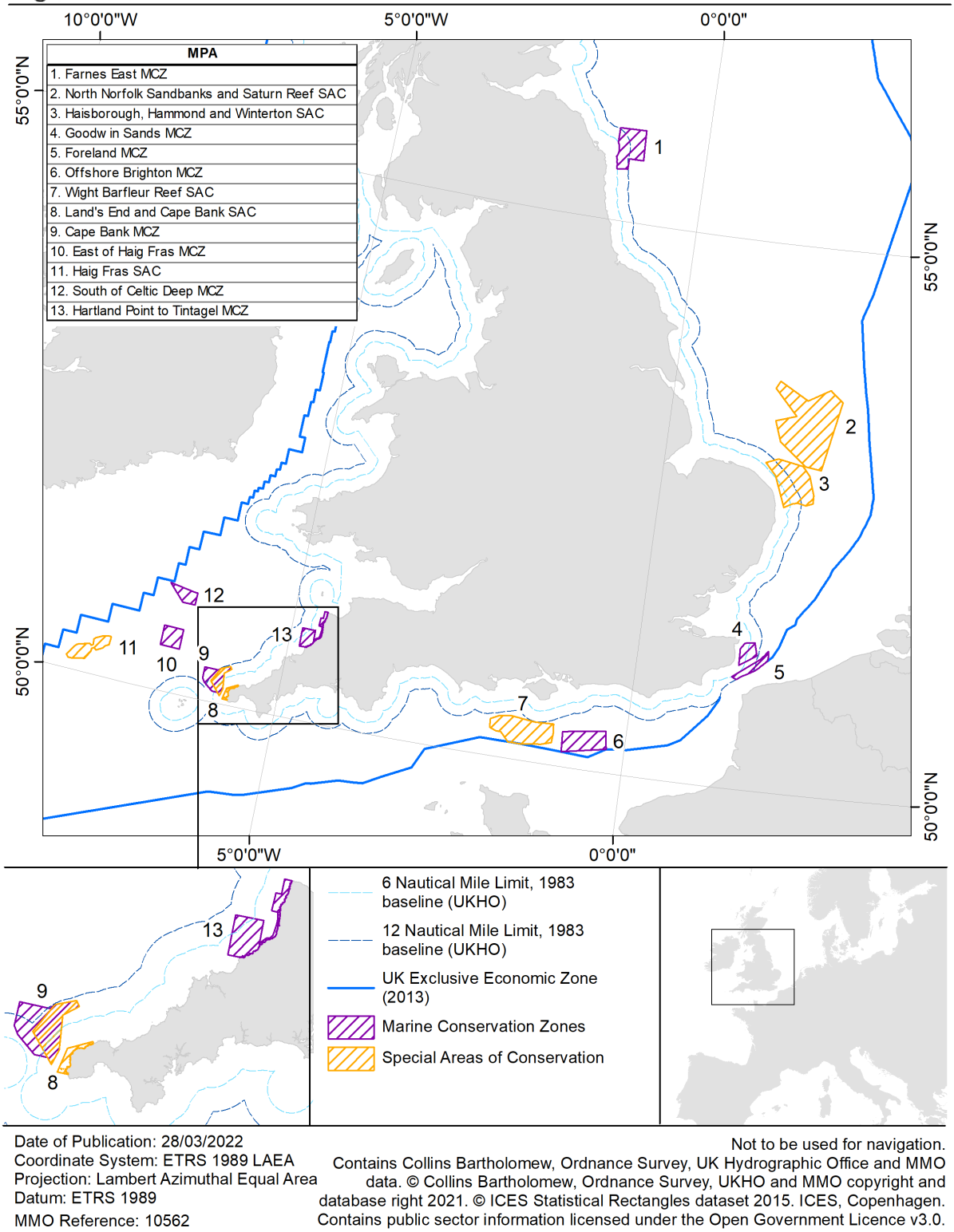
Stage 2 Marine Protected Areas



Date of Publication: 28/03/2022
Coordinate System: ETRS 1989 LAEA
Projection: Lambert Azimuthal Equal Area
Datum: ETRS 1989
MMO Reference: 10562

Figure 1: MPAs included in the Stage 2 assessment.

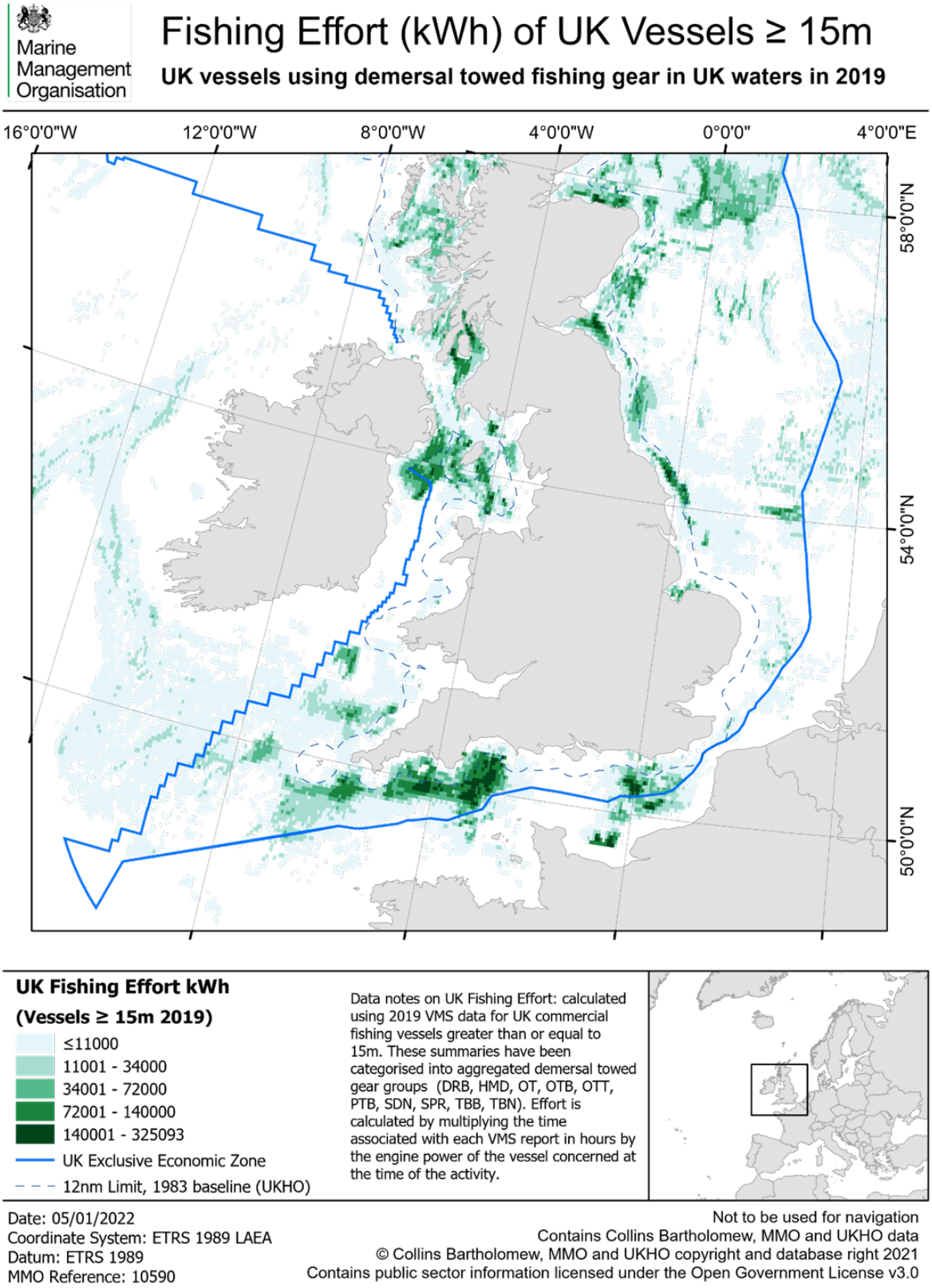


Figure 2: UK demersal fishing effort kWh in 2019 for vessels ≥ 15m.

Literature reviews (section 2.3) have been undertaken to understand the interactions of bottom-towed gear with reef and rock features. While bottom towed gears can have a range of pressures on benthic features, it is the pressures of abrasion and penetration which are most relevant. It is these pressures that have been considered in most detail within the literature reviews. This evidence has been used to inform MPA site level assessments (section 3).

Where the assessment concludes that the risk of significant negative impacts on an MPA's conservation objectives cannot be excluded, management options will be considered.

Several of the MPAs considered have already been afforded protection through the implementation of MMO byelaws[2]. However, in some instances this protection may no longer be considered sufficient as a) more evidence has become available regarding the presence of the feature outside of the spatial extent of the current byelaw and/or b) new powers afforded to MMO under the Fisheries Act 2020 allow for the protection of marine habitats and species features outside of 12 nm whereas current MMO byelaws only extend to the 12 nm limit.

2.2.2. Assumptions

For the purposes of this assessment, circalittoral rock features within MCZs are considered to be analogous to the 'subtidal bedrock reef' and 'subtidal boulder and cobble reef' features within SACs. Fragile sponge and anthozoan communities on subtidal rocky habitats and pink sea fans do not have a clear SAC equivalent. However, advice from the Joint Nature Conservation Committee (JNCC) and Natural England (NE) with regard to fisheries impacts on MCZ habitat features (hereafter 'MCZ fisheries impact advice')[3] suggests, with medium certainty, that unrestricted access to fragile sponge and anthozoan communities on subtidal rocky habitats by bottom towed gears will lead to the conservation objectives for MPAs not being met. Similarly, biotopes in which pink sea fans are present are illustrative of the fragile sponge and anthozoan communities on subtidal rocky habitats and therefore it is assumed that the impact of bottom towed fishing on pink sea fans will likely be similar to that of the fragile sponge and anthozoan communities on subtidal rocky habitats in which they are found.

For the purposes of this assessment, pink sea fans and fragile sponge and anthozoan communities on subtidal rocky habitats are therefore considered alongside rock and reef features.

Evidence describing impacts of bottom towed gears on rocky reef habitats is limited particularly with regard to differences between varying energy and light regimes used to differentiate MCZ features (e.g. high energy circalittoral rock vs low energy infralittoral rock).

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[2] https://www.gov.uk/guidance/marine-conservation-byelaws
[3] http://data.jncc.gov.uk/data/e94680ee-de2e-4ea0-8e65-b86b12893ae0/MCZs-and-fisheries-2011.pdf

Where the interactions between bottom towed gear and the assessed features alone are concluded to have an adverse effect on site integrity (for an SAC) or to hinder the conservation objectives of the site (for an MCZ), there will be no requirement to undertake an in-combination assessment as the impacts will be addressed through management measures.

All other gear-feature interactions within the MPAs assessed that have not been included in this Stage 2 assessment will be considered at a later stage.

2.2.3. Data used in assessment

For each MPA assessment a number of data sources have been used to illustrate site characteristics, the level of fishing activity, and will be used to inform the recommended management options.

- Vessel Monitoring System (VMS) bottom towed gear data from 2016-2020:
    - VMS records the location, date, time, speed, and course of the vessel.
    - Fishing gear information is linked to the VMS data by matching vessel logbook information, using the fleet register, or through local marine officer knowledge of the vessel.
    - For the purposes of this assessment the VMS data in maps used has been filtered to display bottom towed gear activity only.
    - Bottom towed gear VMS data for each site has been displayed on a grid wherein each grid segment is 500 m x 500 m in size. This is intended to demonstrate the density of bottom towed fishing activity from vessels with VMS within each MPA. These maps include fishing speed (0 to 6 knots) VMS records from both UK and Non-UK vessels.
    - Fishing speed VMS records associated with the following gear codes have been included in VMS density maps: TBB – Beam Trawls, OT – Otter Trawls (not specified), OTB – Bottom Otter Trawls, OTT – Otter Twin Trawls, PT – Pair Trawls, PTB – Bottom Pair Trawls, TB – Bottom Trawls, TBN – Nephrops Trawls, TBS – Shrimp Trawls, TX – Other Trawls, DRB – Boat Dredges, HMD – Mechanized Dredge, HMP - Pumps, HMX – Harvesting Machines, SDN – Danish or Anchor Seines, SPR – Pair Seines, SSC – Scottish Seines, SV – Boat or Vessel Seines, SX – Seine Nets (not specified).
    - For the Hartland Point to Tintagel MCZ, VMS data did not show bottom towed gear activity but additional fisheries data (including local expert opinion, vessel sightings data, and Fishermap data) has confirmed that fishing with bottom towed gear occurs in the site.

- Feature data from statutory nature conservation bodies (SNCBs):
    - Natural England are responsible for advice on the conservation of MPA habitats and species in English waters up to 12 nm from the coast.
    - JNCC are responsible for advice on the conservation of UK MPA habitats and species offshore of 12 nm.

SNCB feature data contain a collation of marine habitat and species biotope records created during contracts commissioned by Natural England and JNCC; collected by Defra and associated bodies/agencies; or provided by third parties that have allowed their data to be republished under the Open Government Licence (OGL). MMO have made use of the most appropriate MPA habitat data on a site-by-site basis dependent on its location.

2.2.4. Data gaps and limitations

VMS data has been used to detail the bottom towed gear activity taking place within each site. However, data is currently only widely available for vessels greater than 12 m in length.

While confidence in VMS data is high, there are assumptions and limitations to this data:

- The processing assumes that speeds of 0-6 knots are "fishing speed". This may therefore include vessels travelling at these speeds, but which are not fishing, and exclude any fishing taking place above these speeds leading to over or under-estimates of fishing activity.
- VMS records the location, date, time, speed, and course of the vessel. Fishing gear information has to be linked to the VMS data itself by either matching its logbook information where possible, using the fleet register which may not be up to date, or through local marine officer knowledge of the said vessel.
- Null gear codes are present in the data which may underrepresent the fishing activity of a certain gear type.
- VMS positions are transmitted once every two hours, therefore it is difficult to track the precise movements of vessels via VMS. For this reason, VMS density maps have been produced in order to highlight the areas most frequently visited by vessels using bottom towed gear.

2.2.5. Conservation objectives

The conservation objectives for Stage 2 MPAs (Table 1) are that the features:

1. are maintained in favourable condition if they are already in favourable condition; or
2. are brought into (and remain in) favourable condition if they are not already in favourable condition.

The features include both habitats (e.g. circalittoral rock, Annex I reef and fragile sponge and anthozoan communities) and species (e.g. pink sea fan). The conservation objectives for these features can be achieved by maintaining or restoring, subject to natural change:

- The extent and distribution of the qualifying habitats in the site;
- The structure and function (including biological communities) of the qualifying habitats in the site;

- The supporting processes on which the qualifying habitats rely;
- The supporting processes on which qualifying habitats and the habitats of qualifying species rely;
- The populations of the qualifying species; and
- The distribution of qualifying species within the site.

Conservation objectives specific to the features in each site are detailed below in the MPA site level assessments (section 3).

2.2.6. Associated 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 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**

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).

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). By 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), 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:

Moderate and high energy circalittoral rock, and Annex I reef: rocky

- 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.

Annex I reef: biogenic

- 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 2010). *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).

2.2.7. 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 SAC and North Norfolk Sandbanks and Saturn Reef SAC lie within the East Marine Plan Area. The East Marine Plan[4] was adopted in 2014. Any decision to propose management for these sites will be made in accordance with the East Marine Plan. In particular, the following marine plan policies in the East Marine Plan will be relevant:

- Biodiversity
  - E-BIO-1
- 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 MCZ, East of Haig Fras MCZ, Haig Fras SAC, Hartland Point to Tintagel MCZ, Land's End and Cape Bank SAC and South of Celtic Deep MCZ lie within the South West Marine Plan Area. The South West Marine Plan[5] was adopted in 2021. Any decision to propose management for these sites will be made in accordance with the South West Marine Plan. In particular, the following marine plan policies in the South West Marine Plan will be relevant:

- Biodiversity
  - SW-BIO-1, SW-BIO-2, SW-BIO-3, SW-HAB-1
- Cumulative effects
  - SW-CE-1
- Co-existence

[4] https://www.gov.uk/government/publications/east-inshore-and-east-offshore-marine-plans
[5] https://www.gov.uk/government/publications/the-south-west-marine-plans-documents

    - 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.

MMO North East Plan Area

Farnes East MCZ lies within the North East Marine Plan Area. The North East Marine Plan[6] was adopted in 2021. Any decision to propose management for these sites will be made in accordance with the North East Marine Plan. In particular, the following marine plan policies in the North East Marine Plan will be 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 MCZ, Wight-Barfleur Reef SAC and Offshore Brighton MCZ lie within the South Marine Plan Area. The South Marine Plan[7] was adopted in 2018. Any decision to propose management for these sites will be made in accordance with the South

[6] https://www.gov.uk/government/publications/the-north-east-marine-plans-documents
[7] https://www.gov.uk/government/publications/the-south-marine-plans-documents

Marine Plan. In particular, the following marine plan policies in the South Marine Plan will be 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
- 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 MCZ and Goodwin Sands MCZ also lie within the South East Marine Plan Area. The South East Marine Plan[8] was adopted in 2021. Any decision to propose management for these sites will be made in accordance with the South East Marine Plan. In particular, the following marine plan policies in the South East Marine Plan will be 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

[8] https://www.gov.uk/government/publications/the-south-east-marine-plan-documents

- SE-TR-1

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

2.2.8. Marine Strategy Regulations

MMO will consider the UK Marine Strategy when developing management options, as required by Regulation 9 of the Marine Strategy Regulations 2010[9] .

2.3. Evidence

2.3.1. Literature review of bottom-towed gear interactions with Annex I reef: biogenic (*Sabellaria spinulosa)*

Level of literature

Few studies have empirically tested the effects of bottom towed fishing gear on biogenic habitats (Hiddink *et al.,* 2017). Consequently, this review uses both direct peer reviewed evidence and grey literature to review the impacts of bottom towed fishing gear on biogenic reefs[10]. Due to a lack of evidence, this review has used literature for both *Sabellaria* species (*Sabellaria spinulosa* and *Sabellaria alveolata*) as this is the best available evidence, although it is recognised that both species will have different sensitivities.

Introduction to the habitat

Biogenic reefs are structures created by accumulations of organisms that form substantial habitats or discrete communities arising from the seabed (Holt *et al*., 1998). In contrast to rocky reefs (where animal and plant communities grow on raised or protruding rock), biogenic reefs are created by animals themselves (Brown *et al.,* 1997). Annex I reef: biogenic habitats in Stage 2 MPAs consist of polychaete-reefs made by Ross worms (*Sabellaria spinulosa*). This literature review therefore focuses on bottom-towed fishing impacts on *Sabellaria spinulosa* reef[11]. *Sabellaria spinulosa* is a tube-building polychaete that can occur as isolated individuals, small aggregations, thin crusts, or large reefs covering extensive areas (Fariñas-Franco *et al.,* 2014; Gibb *et al.,* 2014). *S. spinulosa* reefs are relatively rare in English waters, with the majority established near the coastline (Gibb *et al*., 2014; OSPAR Commission, 2013; Van der Reijden *et al.,* 2019).

Impacts of bottom towed gear

The most significant link between human activity and threats to *S. spinulosa* reefs is physical damage caused by towed demersal trawling (Jones *et al.,* 2000; Holt *et al.,*

[9] https://www.legislation.gov.uk/uksi/2010/1627/regulation/9/made
[10] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/310819/sabellaria.pdf
[11] https://sac.jncc.gov.uk/habitat/H1170/

1998). Physical abrasion from trawling can break off or damage the worm tubes resulting in direct mortality of the worms (Gibb *et al.,* 2014; UK BAP, 2000). Where parts of the reef are broken off or damaged, the resulting holes can be further enlarged by wave action (Cunningham *et al.,* 1984). This abrasion pressure can also break reefs into smaller chunks, leading to reef fragmentation and ultimately to reef disappearance (Fariñas-Franco *et al*., 2014; Gibb *et al.,* 2014; Last *et al*., 2012; van der Reijden *et al*., 2019).

Trawl scars on *S. spinulosa* reefs provide evidence of direct physical damage by bottom towed fishing gears (e.g. Pearce, 2017). Marks from otter boards have been observed via sidescan sonar and drop-down videos during surveys of *S. spinulosa* on the east and south coasts of England[12]. Significant evidence of trawl scars from unspecified fisheries on *S. spinulosa* reefs also indicates potential damage from bottom towed gears (Pearce *et al.,* 2007; Pearce *et al.,* 2011).

By disturbing the seabed, bottom towed fishing may also result in higher sediment loads, which could affect reef formation. However, high suspended sediment loads may be unlikely to affect *S. spinulosa* reef as these reefs have evolved to exist in, and are dependent on, such conditions to promote reef growth. Therefore, *S. spinulosa* reef may not be sensitive to increased suspended sediment loads arising from bottom towed fishing (JNCC and Natural England, 2013).

The direct physical impacts of bottom towed gears on *S. spinulosa* reef can have severe biological implications for the polychaetes forming the reef and the flora and fauna associated with the reef. By damaging the biogenic structure, bottom trawling may reduce substrate for epibenthic species (Collie *et al*., 2000; Kaiser *et al.,* 2006), reducing benthic biomass and production (Hiddink *et al.,* 2006). Damage to, and fragmentation of, the reef also reduces the structure and complexity of the habitat (UK BAP, 2000), so that the reef may no longer be able to support epifauna and infauna communities (Last *et al.,* 2012; UK BAP, 2000). The extent of the reef can also be reduced, which can ultimately result in complete habitat loss for the reef's associated communities (Riesen and Reise, 1982). With the most vulnerable animals to trawling often being those responsible for forming the biogenic reefs, bottom trawling can have substantial effects on the production processes and trophic structures in biogenic habitats (Collie *et al.,* 2000; Hiddink *et al.,* 2006).

Variation in impacts

The impacts of bottom towed fishing on biogenic reefs will likely depend on several factors, such as gear type, fishing intensity, and habitat and environmental variables. For example, Kaiser *et al.* (2006) observed that scallop dredging had more severe impacts than otter trawling in biogenic habitats, whilst Vorberg (2000) observed that relatively light shrimp beam trawls did not cause significant damage to *S. alveolata* reef. However, the results of Vorberg (2000) relate exclusively to short-term effects following a once-only disturbance and, thus, medium to long-term impacts from repeated shrimp trawling cannot be ruled out. Furthermore, *S. spinulosa* reef may be more fragile than *S. alveolata* and trawling impacts may also vary between different

[12] Sabellaria spp reef (publishing.service.gov.uk)

biotopes of *S. spinulosa* (e.g. *S. spinulosa* on circalittoral rock versus *S. spinulosa* on circalittoral mixed sediment), as well as with environmental variables (Gibb *et al.,* 2014). For example, Van der Reijden *et al.* (2019) found that, despite high demersal fishing intensities, *S. spinulosa* reefs were present in the Dutch Brown Bank area of the North Sea, potentially because such reefs were located in valleys in-between sand waves, which provided sheltered refuge from fishing abrasion.

Sensitivity and recovery

Biogenic reefs are known to be particularly sensitive to bottom towed fishing gears (Holt *et al.,* 1998; Kaiser *et al.,* 2006) and can potentially take substantial time to recover. Several comparative studies of bottom trawling impacts have found that biogenic reefs are the most severely impacted habitat type (e.g. Kaiser *et al.,* 2006; Sciberras *et al.,* 2018), potentially due to the reef's association with long-lived sessile epifauna (Rijnsdorp *et al.,* 2016). Although *S. spinulosa* is a fast-growing species with annual growth cycles (Holt *et al.,* 1998) and reaches sexual maturity in potentially one or two years or less (Pearce *et al*., 2007), the species associated with *S. spinulosa* reefs are generally slow growing[13]. Therefore, whereas polychaetes with their shorter lifespans can recover in less than a year, sponges – which *S. spinulosa* reefs often support (Gibb *et al.,* 2014) - can take up to eight years to recover from bottom trawling (Kaiser *et al.,* 2006). Furthermore, although the individual polychaetes may have shorter recovery time, the recovery rate of the biogenic structures themselves and the species they support can be far slower than the recovery rates of the individual worms (Hiddink *et al.,* 2019; Rijnsdorp *et al.,* 2016).

There are substantial knowledge gaps regarding empirical evidence for estimating recovery times for *S. spinulosa* reefs (Gibb *et al.,* 2014). Recovery rates will likely vary with several factors, such as the degree of impact, stochastic events, season of impact, larval supply, recruitment, and local environmental factors (Gibb *et al.,* 2014; Tillin and Gibb, 2015). Where there are limited areas of damage, *Sabellaria spp.* reefs could possibly be repaired rapidly (within weeks) through the tube-building activities of adults (Vorberg 2000; Cunningham *et al.,* 1984). However, predicting the rate of recovery following extensive removal is more difficult, with recovery from significant impacts potentially taking several years (Gibb *et al.,* 2014).

From literature evidence and field observations, a JNCC report from 2014 found that fishing levels (at the time of the report) were likely not sufficiently high enough to completely remove *S. spinulosa* reef habitats from UK waters; however, the activities may have reduced reef extent and prevented reefs from fully recovering (Fariñas-Franco *et al.,* 2014). *S. spinulosa* reefs remain extensive at Hastings Shingle Bank and at Thanet offshore windfarm despite clear damage from bottom trawling (Pearce *et al*., 2007; Pearce, 2017). In contrast, reefs in Morecambe Bay that are thought to have been trawled have disappeared and not recovered (Holt *et al.,* 1998), although the lack of recovery could be due to several factors (e.g. environmental changes). In the Hastings Shingle Bank Area, no detectable differences in community structure

[13] https://www.marlin.ac.uk/habitats/detail/377/sabellaria_spinulosa_on_stable_circalittoral_mixed_sediment

were found between a reef developed in six months versus a nearby reef that had been developing for at least five years (Pearce *et al.,* 2007). This could indicate that continued fishing (in the older site) was not allowing reefs to fully recover and was instead keeping the reef at an intermediary stage of development (Fariñas-Franco *et al.,* 2014).

Conclusions

The available evidence indicates that the impacts of bottom towed gears are a significant threat to *Sabellaria* spp. reef through direct physical interactions. Abrasion can cause reef damage, fragmentation, and reef loss. Although levels of impact may vary, bottom towed gears can have substantial biological impacts on the reef's associated plant and animal communities. Formed by fast-growing ross worms, *S. spinulosa* reefs have the potential to recover from bottom towed fishing; however, the recovery rate of the reef will be slower than that of the individual worms. Continued bottom towed fishing may reduce the extent of biogenic reefs and this pressure must be removed to allow sustained recovery. The available literature suggests that biogenic reefs are highly sensitive to bottom towed fishing.

2.3.2. Literature review of bottom towed gear interactions with rock habitats - high and medium energy circalittoral rock and subtidal bedrock or boulder and cobble reef.

Level of literature

Most studies assessing bottom towed fishing impacts focus on soft sedimentary habitats (Roberts *et al.,* 2010), with few empirical studies quantifying the impact of fisheries to hard bottom habitats[14]. Empirical studies of bottom towed gears on rocky reefs are generally restricted to non-UK habitats and assessing the impacts of experimental trawling[21]. Consequently, this review uses both direct peer-reviewed evidence and grey literature to review the impacts of bottom towed fishing gear on high and medium energy circalittoral rock[21].

Introduction to the habitat

The sublittoral zone (extending from the lowest limit of the intertidal to the outer edge of the continental slope) can be divided into the infralittoral zone (dominated by algae) and the circalittoral zone (the subzone below the infralittoral dominated by animals)[15] [16] [17]. Both rock habitats can be assigned to one of three energy levels (high, moderate, and low - depending on exposure to tidal and wave energy) and are associated with rocky reefs (Natural England, 2015). In contrast to biogenic reefs, rocky reefs consist of plant and animal communities that develop on bedrock, stable

[14] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/310821/subtidalbedrock.pdf
[15] https://www.marlin.ac.uk/glossarydefinition/verticalbiologicalzones
[16] https://mhc.jncc.gov.uk/biotopes/jnccmncr00000007
[17] https://mhc.jncc.gov.uk/biotopes/jnccmncr00001510

boulders, and cobbles[17]. Rocky reefs can be extremely variable, with communities varying with rock type, topography, and hydrodynamic conditions[17]. As several of the Stage 2 MPAs contain circalittoral rock (of moderate and high energy) in MMO's management area, this literature review will focus on the impacts of bottom towed gears on rocky reefs, including on subtidal bedrock reef, subtidal boulder reef and subtidal cobble reef[21].

Impacts of bottom towed gear

Bottom towed gears can abrade the substrate of rocky reefs, leading to damage and removal of the attached and associated epifauna[21]. Fishing gear components (e.g. bridles and sweeps) can snag on rocks, causing abrasion damage and leading to rocks and boulders being rolled, moved, and displaced (Freese *et al.,* 1999; Grieve *et al*., 2014; Hall-Spencer *et al*., 2002). Bottom towed gears can also modify and homogenise the substrate, as soft rocks are broken up (Attrill *et al*., 2011). Although harder substrate is relatively resistant to physical damage, bottom towed fishing gears can still damage the substrate and its associated communities (Roberts *et al.,* 2010).

Bedrock, boulder, and cobble reef have variable levels of accessibility to bottom towed fishing and thus variable levels of vulnerability to physical damage[21]. Steep rock, uneven ground and boulder reef are generally unsuitable for bottom trawls and dredges due to the risk of gear damage (Howarth and Stewart, 2014). However, rocky reefs can still be damaged if they are located amongst or adjacent to commercially viable fishing grounds (Boulcott and Howell, 2011) or they are fished by towed gears that are designed for rocky habitats, such as rock-hopper trawls (Hartnoll, 1998; Roberts *et al*., 2010).

Towed gears may indirectly impact rocky reef communities through increased sediment load (Hartnoll, 1998). Suspended material can affect the efficiency of filter feeding species that are frequently found on sublittoral rock habitats (Hartnoll, 1998). Depending on the extent of siltation, moderate and high energy circalittoral rock can have medium-to-high sensitivity to this pressure (Tillin *et al.,* 2010) with increased sediment loading particularly posing a risk to rocky habitats found adjacent to soft sediments subjected to demersal towed fishing (Hartnoll, 1998). However, direct physical impacts are generally considered the highest concern for the impacts of bottom towed fishing on rocky reef habitats (Hall *et al.,* 2008).

Although harder rock substrates are less vulnerable to physical damage, bottom towed gears can substantially impact the fauna and flora associated with sublittoral rock habitats. Towing trawls across rocky substrates can cause damage or death to substantial proportions of large, upright attached species, such as sponges and corals (Løkkeborg, 2005). For example, in the Gulf of Alaska during bottom trawling on pebble, cobble and boulder habitats, 67% of sponges were damaged during a single trawl pass (Freese *et al.,* 1999). Other species (such as hydroids, anemones, bryozoans, tunicates, and echinoderms) are also vulnerable to damage (Freese *et al*., 1999; McConnaughey *et al*., 2000, Sewell and Hiscock 2005). Alongside, the removal of erect epifaunal and large sessile species (Sewell and Hiscock 2005), trawling can lead to habitat homogenisation and reduced biodiversity and habitat complexity (Attrill *et al*., 2011; Engel and Kvitek, 1998, Freese *et al.,* 1999; Goodwin

et al., 2011; Sewell and Hiscock, 2005). As shown by Boulcott and Howell (2011), not all epifauna on rocky reefs may be damaged during trawls due to inconsistent contact between the gear and the seabed on uneven ground. However, due to the gear bouncing off the substrate, bottom towed gears can cause incremental damage to benthic communities in rocky habitats, which contrasts to loose sediment habitats where the majority of damage occurs on the first pass (Boulcott and Howell, 2011).

Variation in impacts

As for biogenic reefs, the impacts of bottom towed fishing on sublittoral rock habitats will depend on several factors, such as gear type, gear design and fishing intensity (Engel and Kvitek, 1998; Van Dolah *et al*., 1987). However, impacts are likely to be variable due to the wide variety of structures and communities present[17]. For example, communities with higher proportions of larger, long-lived, fragile, and sessile epifauna may be the most vulnerable (Hiddink *et al.,* 2017; Roberts *et al*., 2010). Resistance to damage at a physical level may also vary with substrate type. Additionally, impacts may vary with environmental conditions and topographical variation (Hinz *et al.,* 2011), for example water temperature and depth may affect the recovery of sponges (Van Dolah *et al*., 1987) and habitats with higher topographical variation may have patchier impacts[21] due to the gears bouncing off the substrate, which protects species in crevices (Boulcott and Howell, 2011).

Sensitivity and recovery

As discussed, the sensitivity of sublittoral rock habitats is likely to be highly variable due to the wide variety of communities that can be present (Roberts *et al.,* 2010). For example, rocks with erect branching species may have high sensitivity to all bottom towed gear types (even at low levels of fishing intensity), whereas rocks with low-lying and fast-growing fauna may have low sensitivity, albeit to a single gear pass (Eno *et al.,* 2013; Hall *et al*., 2008). However, generally rocky habitats are considered sensitive to bottom towed fishing gears.

A non-quantitative sensitivity assessment developed by Tillin *et al.* (2010) assessed the sensitivity of MPA features to various pressures. This sensitivity matrix classified moderate and high energy circalittoral rock as having medium or medium-to-high sensitivity to penetration and abrasion pressures, except for moderate energy circalittoral rock, which had low-to-high sensitivity to surface abrasion.

Recovery rates for the habitats associated with sublittoral rock will similarly depend on the species present. Recovery rates may vary with life-history characteristics, larval longevity, dispersal potential, recruitment, and growth rates (Kaiser *et al.,* 2018; Roberts *et al*., 2010). Some subtidal rock organisms may have strong regenerative abilities, whereas some sessile species rely on spawning events to recolonise, which can prevent reestablishment if fishing occurs frequently in-between spawning events (Roberts *et al*., 2010). The longevity of species will also be critical to recovery rates, with short-lived fauna (e.g. with lifespans of 1 to 3 years) potentially recovering from trawling in 0.5 to 3 years, whereas long-lived fauna (e.g. with lifespans > 10 years) may take several years (> 8 years) to recover (Hiddink *et al.,* 2019).

Field evidence from the UK provides an indication that rocky reef habitats can recover from the impacts of bottom towed fishing when this pressure is removed. In 2008, the use of bottom towed fishing gear was prohibited in Lyme Bay for the purpose of maintaining and recovering the benthos in this circalittoral rock, boulder, and cobble reef habitat (Attrill *et al.,* 2012). Three years after this closure, species abundance, diversity and richness improved (Attrill *et al.,* 2012) with changes indicating recovery of some epibenthic fauna (Sheehan *et al.,* 2013). However, not all sites in the MPA exhibited recovery trends (Attrill *et al.,* 2012), potentially due to variation in life-history characteristics (Kaiser *et al.,* 2018), with long-lived species such as pink sea fans (*Eunicella verrucosa*) and Ross corals (*Pentapora foliacea*), potentially taking 17 to 20 years to recover, whereas shorter-lived species (such as scallops and dead man's fingers, *Alcyonium digitatum*) taking 2.5 to 6 years to recover.

Although several factors can affect habitat recovery (e.g. environmental changes and other anthropogenic disturbances), the prohibition of bottom towed fishing in Lyme Bay and the subsequent positive change for most species over the following 10 years indicates that such fishing activities are incompatible with circalittoral rocky reef habitats and other areas of substantial hard substrate that have an affinity for species with poor recoverability (Kaiser *et al.,* 2018). Consequently, it is recommended that bottom towed fishing should be entirely avoided in these habitats within MPAs (Kaiser *et al.,* 2018).

Conclusions

The available evidence indicates that bottom towed gears are a risk to the condition of rocky reef, boulder reef and cobble reef, and the benthic communities associated with moderate and high energy circalittoral rock. Although hard rocky substrates themselves may be resistant to physical damage, bottom towed gears can damage and remove attached epifauna, and alter the habitat by breaking down and moving rocks and boulders. Despite limited empirical studies, the available literature suggests that subtidal rocky habitats, including cobble and boulder reef, are at risk of significant impacts from bottom towed gears[21]. Circalittoral rock habitats have significant overlaps with Annex I reef: rocky habitats, which allow for the use of the same approach. However, it should be noted that as rocky habitats are highly variable and some rocky reef communities (e.g. highly exposed to energy) may be more resilient to bottom towed gear impacts[21].

2.4. Management options

As indicated by the evidence outlined above, all of the Stage 2 sites contain features (e.g. circalittoral rock features, or Annex I reef features) that are sensitive to interaction with bottom towed gear, wherein the conservation objectives for these features (or sub-features) will not be furthered irrespective of feature condition, the level of pressure, or background environmental condition. Proposed management measures for these interactions generally fall within four options:

Option 1. No fisheries restrictions. Introduce a monitoring and control plan within the site.

Option 2. No statutory restrictions. Introduce a voluntary agreement.

Option 3. Reduction of pressures associated with bottom towed fishing gear(s) of concern, through zoned management (partial site prohibition of these gears over areas of sensitive features).

Option 4. Removal of pressures associated with bottom towed fishing gear(s) of concern through a whole site prohibition of these gears.

After the call for evidence stage, specific management areas will be developed based on additional evidence received and stakeholder feedback ahead of formal consultation on any measures.

Where management is deemed necessary MMO will follow SNCB guidance regarding the application of a management buffer zone to ensure appropriate protection of the relevant features. This will likely follow a gear warp length: water depth ratio as below in Table 2.

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

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

If a management buffer deviates significantly from the above, then this will be detailed with the final recommended management measure.

2.5. Displacement

It is recognised that the addition of management measures (Option 2, 3 or 4) could lead to displacement of fishing activities to sensitive habitats elsewhere in English seas, though the location and environmental cost is unknown (Hiddink *et al*., 2006, Vaughan, 2017). It should however be noted that MPAs were themselves chosen to protect rare and representative habitats, species, and geological features to contribute to an ecologically coherent network. The potential impact of displacement to areas outside of MPAs does not remove the requirement to ensure that fishing is managed to further the conservation objectives of the MPAs. MMO understands that 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.

2.6. Monitoring and control

MMO has developed generic monitoring and control plans for all MPAs. Each MPA is provided with a tier category 1-3 based on the gear-feature interactions occurring, and the level of risk identified from activity data within the MPA fisheries assessments. All MPAs that require MMO management are assigned to a generic tier 3 monitoring and control plan.

Tier 3 generic monitoring and control plans include, but are not limited to, the following monitoring and control measures:

2.6.1. Surveillance monitoring

- Alerts will be set up for the managed areas of MPAs and vessels carrying VMS will be monitored 24 hours a day, seven days a week by MMO Fisheries Monitoring Centre (FMC) Operations team. Any vessels carrying restricted gear, suspected of fishing will be investigated and appropriate enforcement action taken if infringements have occurred.
- If any additional information of vessels breaching MPA conservation regulations are identified (e.g. removal of protected features or eyewitness accounts of infringements), an Intelligence Report (IR) will be completed and submitted to MMO Intelligence team for further investigation.
- MPA activity monitoring inspections (MPAsums) will be carried out by Fisheries Patrol Vessels (FPVs) during routine taskings. They will also be completed on an opportunistic basis during normal fisheries patrols if in the vicinity of the MPA. VMS activity data will be used to support peak patrol tasking periods for the MPA.
- Routine aerial patrols will be used opportunistically (flight passes) to record fishing activity in the MPA.
- FPVs/aircrafts will be specifically tasked to this MPA when infringements occur if in the vicinity, to aid investigations for enforcement action.

2.6.2. Intelligence / information sharing

- Any monitoring and control intelligence received will be reviewed by MMO.
- VMS data, MPA intelligence and inspections will be used to identify any significant changes in fishing activity levels and/or new activities taking place within the MPA. Any significant changes will be reviewed, and data will be reported on annually during the MPA reporting period.
- Bespoke measures (e.g. targeted surveillance) can be applied to an MPA if required, to enhance compliance and enforcement of management measures and/or in response to intelligence for additional monitoring of activity changes.

2.6.3. Reporting and Review

- An annual MPA report will be completed by MMO Marine Conservation Team. As part of the annual report, MPA VMS/landings/logbook data, sightings and inspection data and any intelligence. will be reviewed to identify any changes in fishing activity and/or infringements. This may trigger further bespoke monitoring and control measures and/or review of the MPA fisheries assessment.
- The MPA assessment will be reviewed every five years or sooner if significant new evidence triggers an early review, this may include:
    - New information on feature location (e.g. through SNCB survey work);
    - New information on gear/feature impacts (e.g. through new SNCB advice);

- Revised/updated conservation objectives (provided by SNCBs);
- Revised/updated feature condition (provided by SNCBs);
- Changes made to IFCA management areas (cross-boundary MPAs); or
- A variation (significant increase or change – spatial/temporal/gear used/modifications) in fishing activity from that assumed in the previous MPA assessment and/or MPA annual report.

3. MPA site level assessments

3.1. Cape Bank MCZ

3.1.1. Designated site location

Cape Bank MCZ is found in the south west of England and is located within the Western Channel and Celtic Sea. Cape Bank MCZ lies to the west of the Land's End peninsula and extends approximately 33 kilometres (km) from the coast. The site protects an area of approximately 474 square kilometres (km^2) (Figure 3).

It is a joint inshore and offshore site and fishing in the site is regulated by Cornwall Inshore Fisheries and Conservation Authority (IFCA, 0-6 nm) and MMO (>6 nm) and relevant SNCBs for the site are NE (0-12 nm) and JNCC (>12 nm).

Bottom towed gear is already prohibited in the majority of the Cape Bank MCZ via the Land's End and Cape Bank European Marine Site (Specified Areas) Bottom Towed Gear Byelaw[18].

There is no direct management of the MCZ by Cornwall IFCA, however the following byelaws may impact upon the use of bottom towed gear within the site:

- *Methods of Fishing (Dredges) Byelaw* defining gear specifications and other conditions for the use of dredges for fishing;
- *Scallop Dredge (Limited Fishing Time) Byelaw* limiting the fishing time for scallop dredging;
- *Shellfish Boats* limiting the overall length of vessels used to fish for shellfish; and
- *Trawling* limiting the overall power and length of vessels fishing using a trawl.

More information on these byelaws can be found on Cornwall IFCA website. MMO will continue to engage directly with IFCAs regarding any future recommendations for management measures nearby/adjacent to their areas of jurisdiction.

[18] https://www.gov.uk/government/publications/lands-end-and-cape-bank-european-marine-site-specified-areas-bottom-towed-gear-byelaw

3.1.2. Designated features

Cape Bank MCZ was formally designated in May 2019.

Cape Bank MCZ consists of a rocky reef system and large expanses of subtidal coarse sediment, both of which are fully subtidal. The reef extends in a broad arching crescent, roughly aligned with the coastline. The reef supports a high level of biodiversity, including species such as sponges, soft corals, cup corals and anemones, starfish, and sea urchins, while the rock surface may be covered with mixed tufted or encrusting animal colonies (bryozoans). The site also provides habitat for the commercially important spiny lobster.

This assessment considers the interaction between bottom towed fishing gears and the moderate energy circalittoral rock feature. The remaining feature (subtidal coarse sediment) and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

The most recent survey of Cape Bank MCZ was unable to classify the reef habitat to its specific energy class due to the similarity of the acoustic signatures associated with high and moderate energy circalittoral rock and the close proximity of these features observed in the video/photographic data. As a result, energy classes were not assigned and the classification of rock habitats was left at the parent, Eunis Level 2 feature – circalittoral rock (Department for Environment, Food, and Rural Affairs, 2016). Due to the presence of moderate energy circalittoral rock observed throughout the site via drop down video, for the purposes of this assessment, and in accordance with the precautionary principle, circalittoral rock has been used as a proxy for the presence of moderate energy circalittoral rock. As detailed in Figure 3, a large proportion of Cape Bank MCZ consists of circalittoral rock.

Figure 3 shows the distribution of designated features within the MCZ. Table 3 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 3: conservation objectives for designated features of the Cape Bank MCZ[19] with the feature currently being assessed highlighted in green.

Designated feature	Conservation objective
Moderate energy circalittoral rock	Recover to favourable condition (please see section 2.2.5 for the attribute information).
Subtidal coarse sediment	

[19] Marine Conservation Zones: Cape Bank - GOV.UK (www.gov.uk)

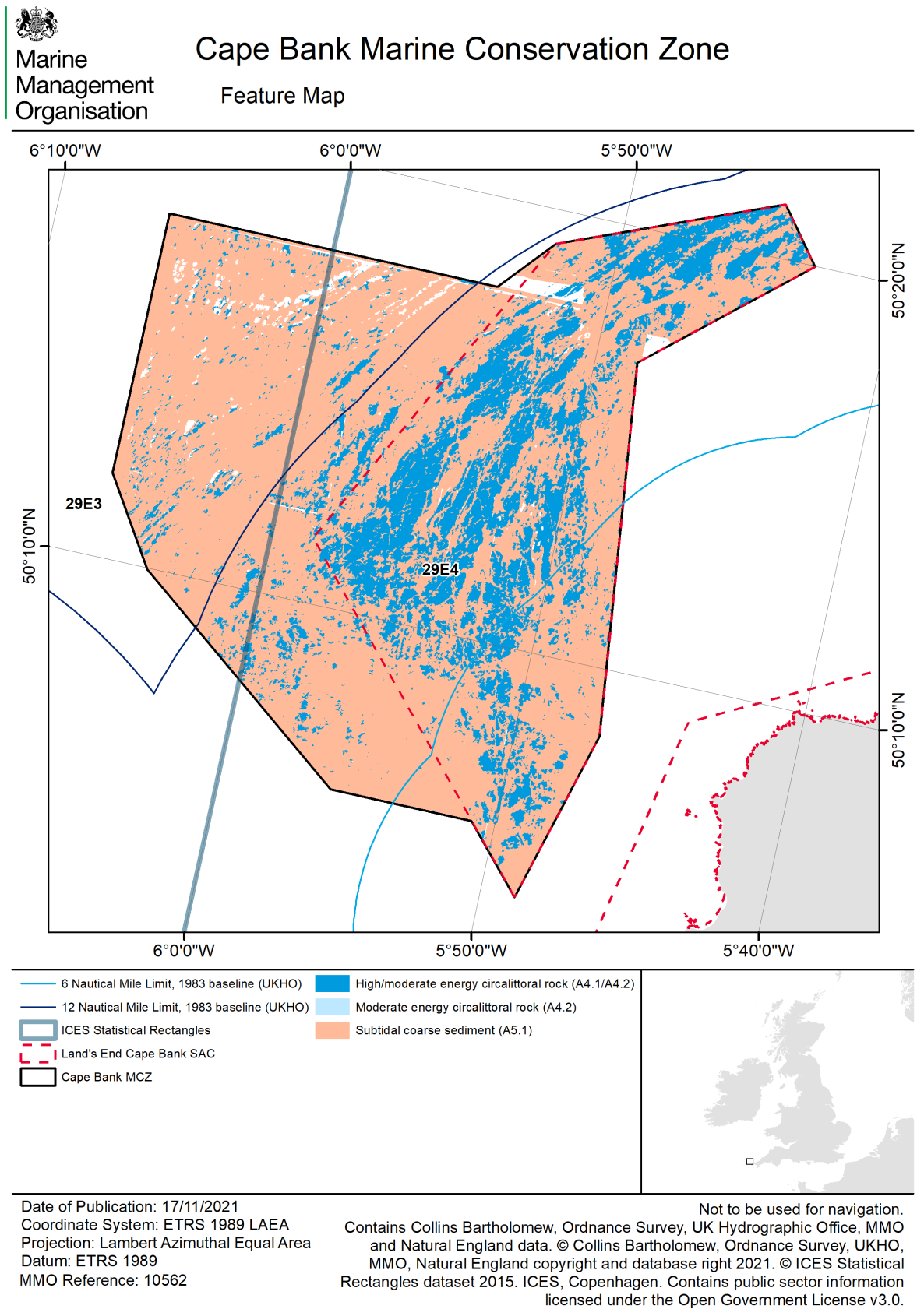

Figure 3: Cape Bank MCZ location and designated feature distribution.

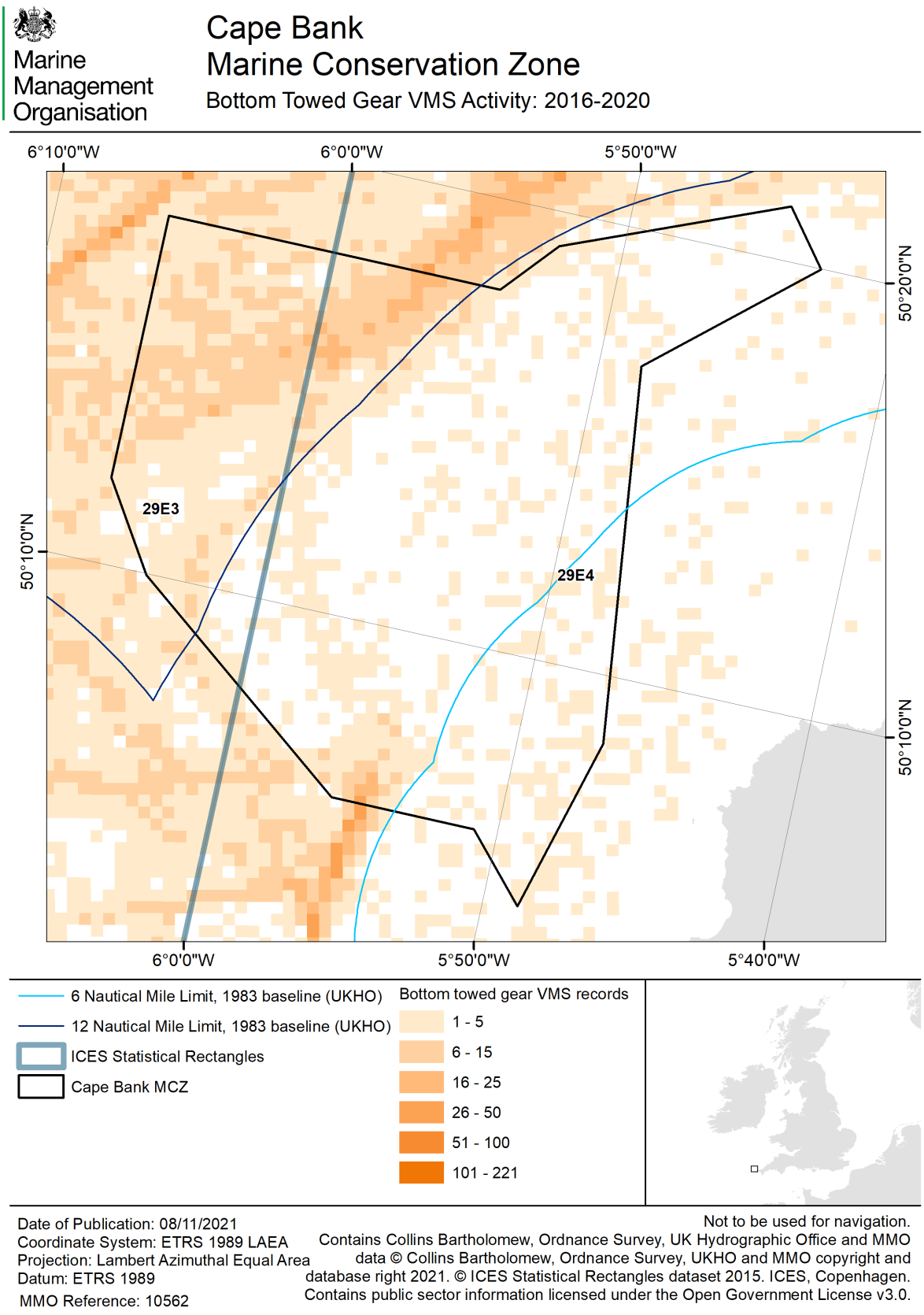

Figure 4: Cape Bank MCZ VMS activity from bottom towed gear from 2016-2020.

3.1.3. Fishing activity

VMS records show bottom towed gear activity in the site (Figure 4) 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. The majority of bottom towed gear activity occurs in the western portion of the site, outside of 12 nm.

3.1.4. Fisheries impact assessment conclusion

The VMS data (Figure 4) shows bottom towed gear activity is taking place over the protected circalittoral rock feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on circalittoral rock, MMO conclude this interaction will lead to a significant risk of hindering the conservation objectives of the site.

3.2. East of Haig Fras MCZ

3.2.1. Designated site location

East of Haig Fras MCZ is located approximately 67 km west of Land's End, in the Celtic Sea and protects an area of approximately 400 km^2 (Figure 5).

3.2.2. Designated features

East of Haig Fras MCZ was formally designated in December 2013. In January 2016 an additional feature was designated and in May 2019 an additional three features were designated.

The seabed is heterogeneous, with small patches of habitat blending into each other. Ridges composed of a mosaic of coarse and mixed subtidal sediments run through the site. These sediment ridges are topped with a mosaic of rocky features (high and moderate energy circalittoral rock) which run throughout the site, being separated by mobile sand or mud (Figure 5).

The rocky cobbles and boulders provide habitat for hydroids and bryozoans along with other species, such as sponges, cup corals and squat lobsters.

This assessment considers the interaction between bottom towed fishing gears and the moderate and high energy circalittoral rock features. The remaining features, and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites. As this site has a mosaic of habitats, the whole site will be treated as the most sensitive feature.

Figure 5 shows the distribution of designated features within the MCZ.

Table 4 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 4: Conservation objectives for designated features of the East of Haig Fras MCZ[20] with the features currently assessed highlighted in green.

Designated feature	Conservation objective
High energy circalittoral rock Moderate energy circalittoral rock Subtidal coarse sediment Subtidal mixed sediments mosaic Subtidal sand Subtidal mud Sea-pen and burrowing megafauna communities	Be brought into favourable condition, and remain in such condition, meaning that – • Extent is stable or increasing; and • Structures and functions, quality, and the composition of characteristic biological communities (which includes a reference to the diversity and abundance of species forming part of or inhabiting each habitat) are such as to ensure that they remain in a condition which is healthy and not deteriorating. Any temporary deterioration in condition is to be disregarded if the habitats are sufficiently healthy and resilient to enable their recovery. Any alteration to the features brought about entirely by natural processes is to be disregarded.
Fan mussel (Atrina fragilis)	Be brought into favourable condition, and remain in such condition, meaning that – • the quality and quantity of its habitat and the composition of its population in terms of number, age and sex ratio are such as to ensure that the population is maintained in numbers which enable it to thrive. • Any temporary reduction of numbers is to be disregarded if the population is sufficiently thriving and resilient to enable its recovery. • Any alteration to that feature brought about entirely by natural processes is to be disregarded.

[20] East of Haig Fras MPA – Conservation Advice | JNCC Resource Hub

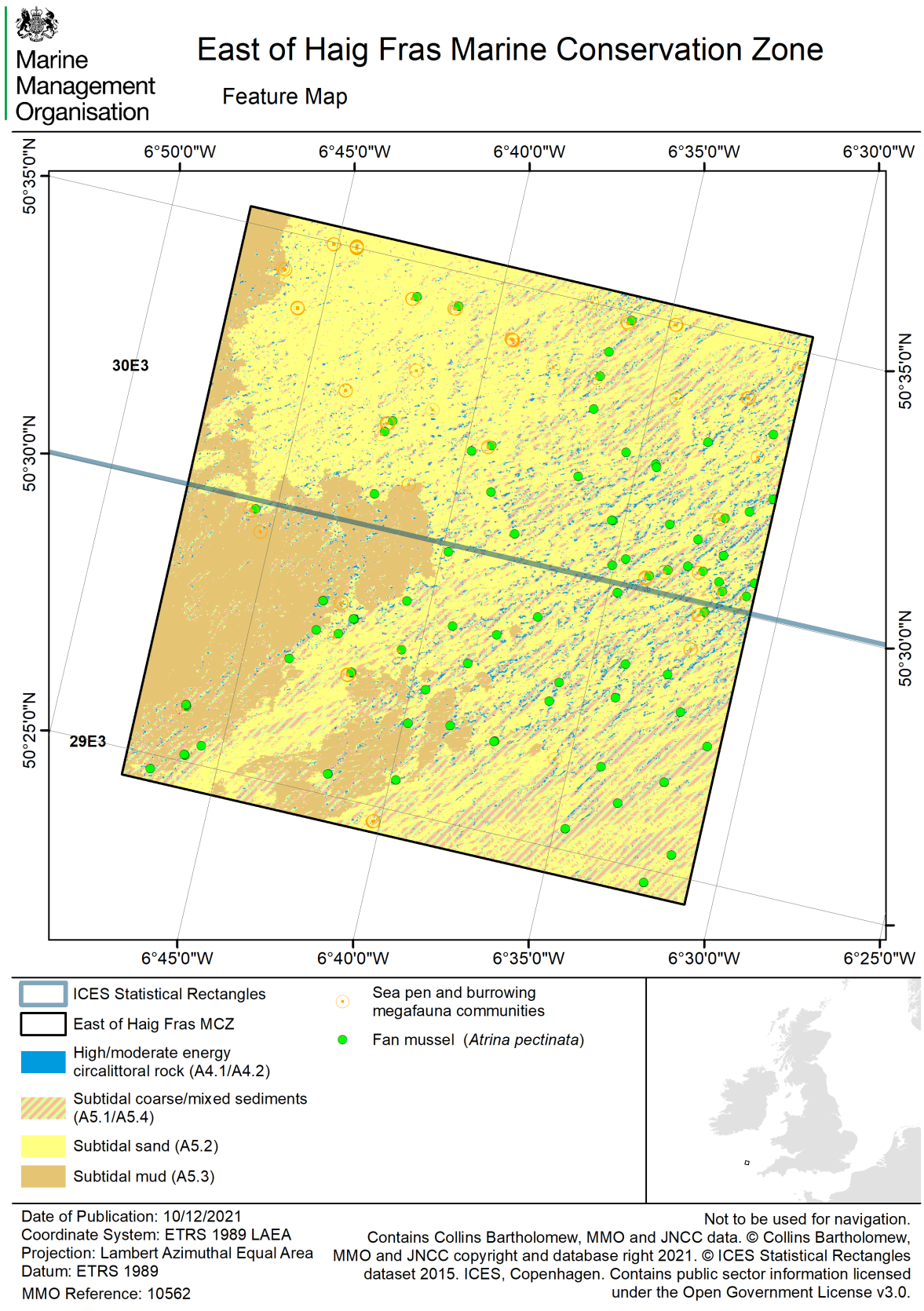

Figure 5: East of Haig Fras MCZ location and designated feature distribution.

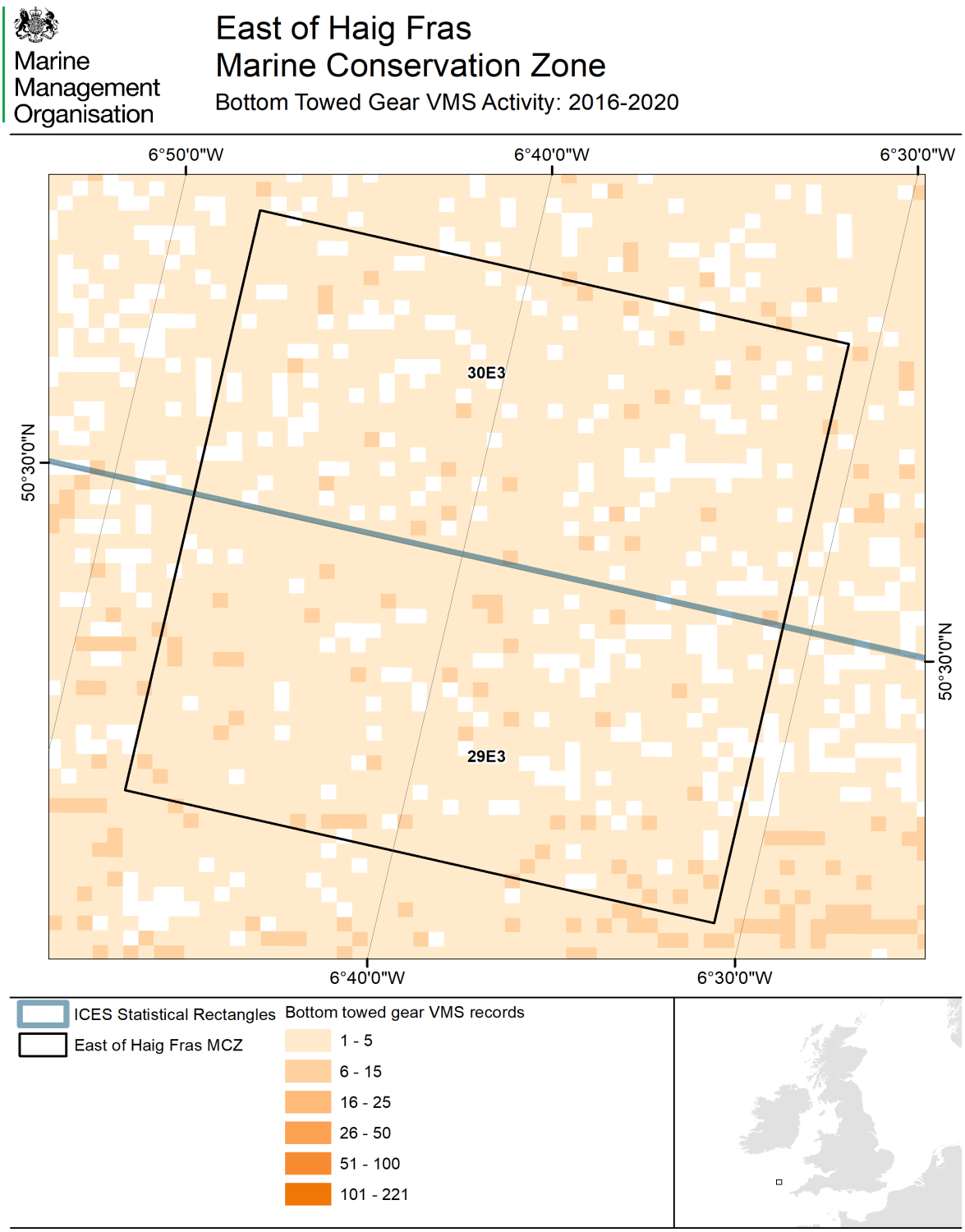

Figure 6: East of Haig Fras MCZ VMS activity from bottom towed gear from 2016-2020.

3.2.3. Fishing activity

VMS records show bottom towed gear activity in the site mainly consists of non-UK vessels (82%) conducting demersal trawls. In particular, bottom otter trawls are used by French vessels. Some limited dredging and beam trawling activity by Irish vessels has been known to occur and UK vessels are active in the site, albeit at considerably lower intensities, with beam trawls the gear of choice. Activity occurs relatively consistently throughout the site.

3.2.4. Fisheries impact assessment conclusion

As detailed in Figure 5, East of Haig Fras MCZ consists of a mosaic of habitats with circalittoral rock occurring throughout the site albeit in small, isolated patches.

The VMS data (Figure 6) shows bottom towed gear activity is taking place over the protected reef feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will lead to a significant risk of hindering the conservation objectives of the site.

3.3. Farnes East MCZ

3.3.1. Designated site location

Farnes East MCZ is a joint inshore and offshore site situated in the north east of England approximately 11 km from the Northumberland coast (Figure 7). Fishing in the site is regulated by MMO (>6 nm) and its relevant SNCBs are NE (0-12 nm) and JNCC (>12 nm). The site covers an area of approximately 945 km^2.

3.3.2. Designated features

The MCZ was formally designated in January 2016.

The seabed is predominantly sedimentary, composed of subtidal coarse sediment, subtidal sand, and subtidal mixed sediments, with a scattering of small patches of moderate energy circalittoral rock. The rock habitat supports species of hydroids, bryozoans, and sponges. A glacial trench, which forms the deepest part of the MCZ, contains subtidal mud.

This assessment considers the interaction between bottom towed fishing gears and the moderate energy circalittoral rock feature. The remaining features and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 7 shows the distribution of designated features within the MCZ.

Table 5 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 5: Conservation objectives for designated features of the Farnes East MCZ[21] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
Moderate energy circalittoral rock	Subject to natural change, remain in favourable condition, such as their: • Extent is stable or increasing; and • Structures and functions, quality, and the composition of their characteristic biological communities are such as to ensure that they are in a condition which is healthy and not deteriorating.
Subtidal coarse sediment	
Subtidal sand	
Subtidal mud	Subject to natural change, be brought into favourable condition, and remain in such condition, such that their: • Extent is stable or increasing; and • Structures and functions, quality, and the composition of their characteristic biological communities are such as to ensure that they are in a condition which is healthy and not deteriorating.
Subtidal mixed sediments	
Sea-pen and burrowing megafauna communities	
Ocean quahog (*Arctica islandica*)	Subject to natural change, be brought into favourable condition, and remain in such condition, such that: • The quality and extent of its habitat is stable or increasing; and • The population structure allows numbers to be maintained or increased.

[21] Farnes East MPA | JNCC - Adviser to Government on Nature Conservation

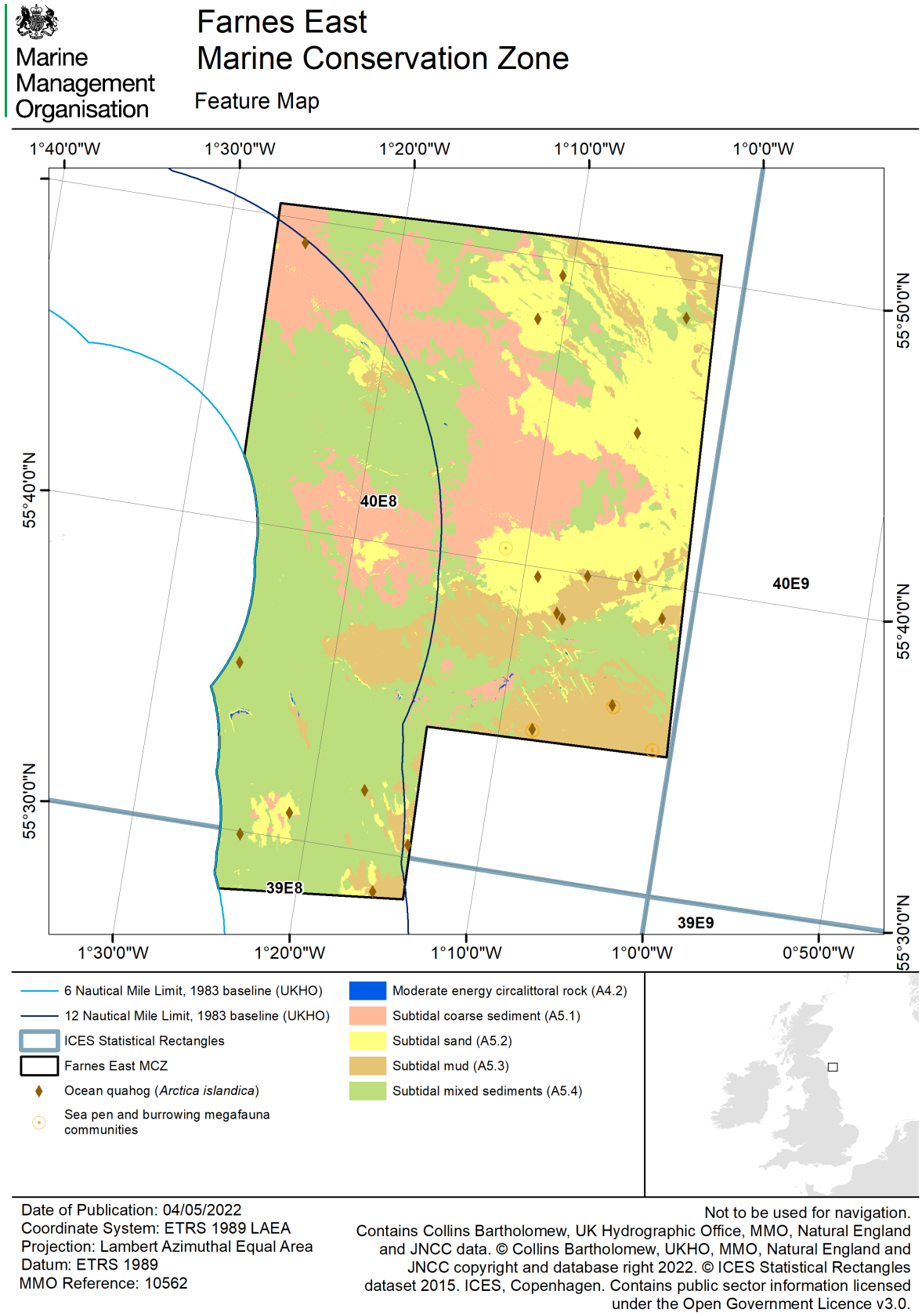

Figure 7: Farnes East MCZ location and designated feature distribution.

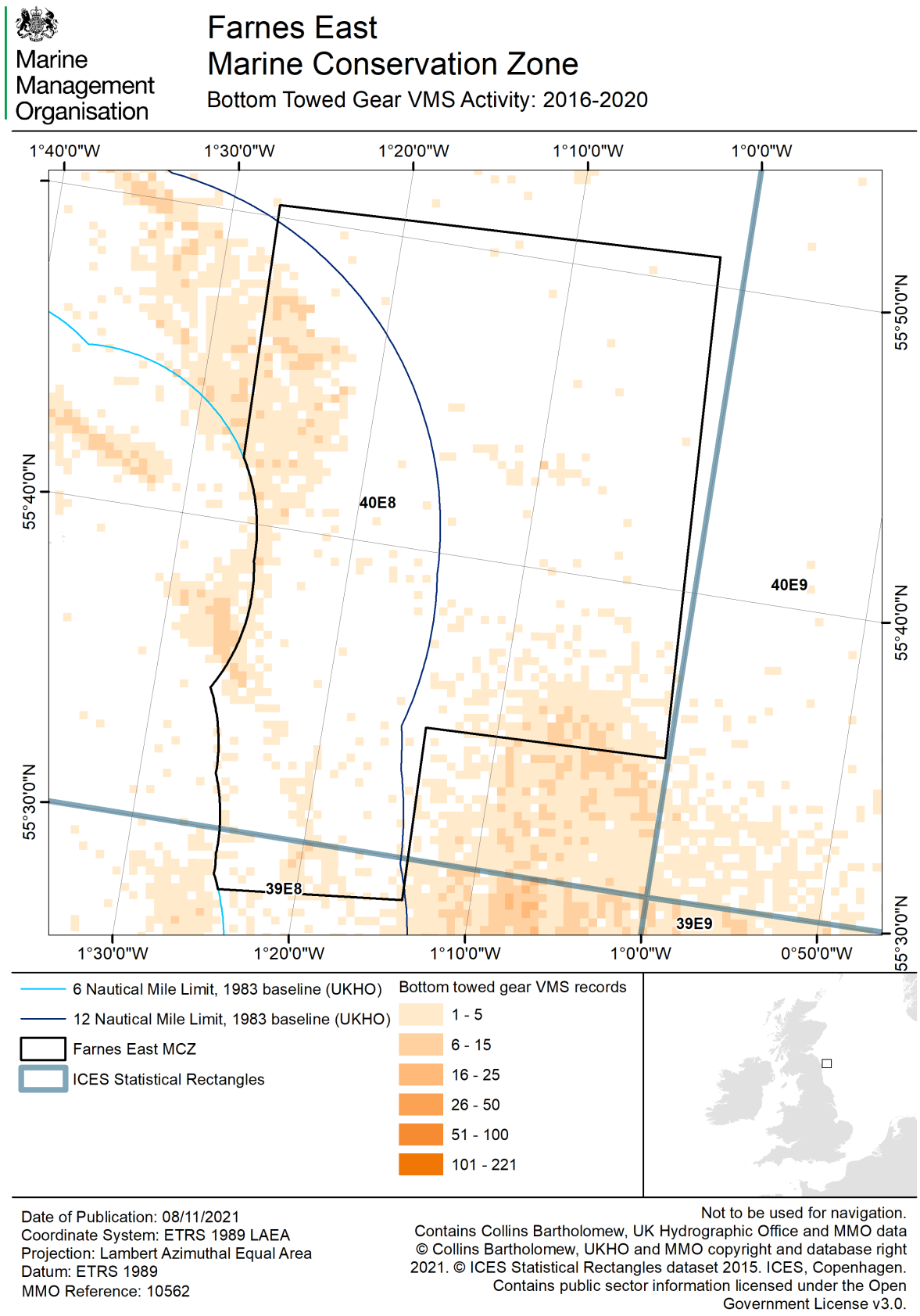

Figure 8: Farnes East MCZ VMS activity from bottom towed gear from 2016-2020.

3.3.3. Fishing activity

VMS records show that bottom towed gear activity within the site consists overwhelmingly of UK activity (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, particularly via boat dredge, with some hand mechanised dredging. This activity occurs primarily in the western section of the site, inside of the 12 nm limit. The remainder of the UK activity within the site consists of demersal otter trawling, largely along the south-eastern edge of the site, outside of 12 nm, though sporadic trawling does occur within 12 nm.

3.3.4. Fisheries impact assessment conclusion

As detailed in Figure 7, moderate energy circalittoral rock occurs in small, isolated patches predominantly in the south of Farnes East MCZ.

The VMS data (Figure 8) shows that bottom towed gear activity is taking place over this feature. Given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock reef features, MMO conclude that an interaction between bottom towed gears and the moderate energy circalittoral rock will lead to a significant risk of hindering the conservation objectives of the site from being furthered.

3.4. Foreland MCZ

3.4.1. Designated site location

Foreland MCZ is a site covering an area of 244 km^2. It is located in the southern North Sea and English Channel, extending along the mid-channel between Kent and France (Figure 9).

It is a joint inshore and offshore site and fishing in the site is regulated by Kent and Essex Inshore Fisheries and Conservation Authority (0-6 nm) and MMO (>6 nm) and its relevant SNCBs are NE (0-12 nm) and JNCC (>12 nm). There is no direct management of the MCZ by Kent and Essex IFCA or MMO, however the following Kent and Essex IFCA byelaws may impact upon the use of bottom towed gear within the site:

- *Vessel size and engine power byelaw* which prohibits vessels greater than 17 metres in length from fishing within the District and vessels with and engine power greater than 221 kilowatts (kW) (or 243kW before derating) from using towed gear.
- *Dredging for mussels* restricting the methods by which fishers can dredge for mussels within a given area of the District.
- *Dredging for scallops* restricting the methods by which fishers can dredge for scallops within a given area of the District.
- *Limitation on quantities and minimum size of mussels* limits the maximum fishing effort and minimum size a mussel can be removed from the fishery.

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

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

3.4.2. Designated features

Foreland MCZ was formally designated in May 2019.

Foreland MCZ contains a variety of different habitats ranging from subtidal sand to coarse sediments and rocky habitats which support a wide diversity of species. The site also includes deep water rock habitats subject to moderate to high wave energy or tidal currents. These are dominated by animal communities as there is insufficient sunlight for plant growth. The types of animals that thrive here include colourful sponges clinging to the rock and a dense 'carpet' of sea firs and cup corals, alongside anemones, and sea squirts. Commercially valuable crustaceans such as lobsters and crabs shelter within rocky crevices, and a range of fish species such as wrasse and topknots forage in this habitat. The features being assessed within this document are displayed in Table 6.

This assessment considers the interaction between bottom towed fishing gears and the moderate and high energy circalittoral rock features. The remaining features, and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites. As this site has a mosaic of habitats in the southern area, this part of the site will be treated as the most sensitive feature.

Figure 9 shows the distribution of designated features within the MCZ. Table 6 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 6: Conservation objectives for designated features of the Foreland MCZ[22] with the features currently assessed highlighted in green.

Designated feature	Conservation objective
Subtidal sand	Subject to natural change, remain in favourable condition (please see section 2.2.5 for attribute information).
English Channel outburst flood features	
Subtidal coarse sediment	Subject to natural change, be brought into favourable condition, and remain in such condition (please see section 2.2.5 for attribute information).
High energy circalittoral rock	
Moderate energy circalittoral rock	

[22] Marine Conservation Zones: Foreland - GOV.UK (www.gov.uk)

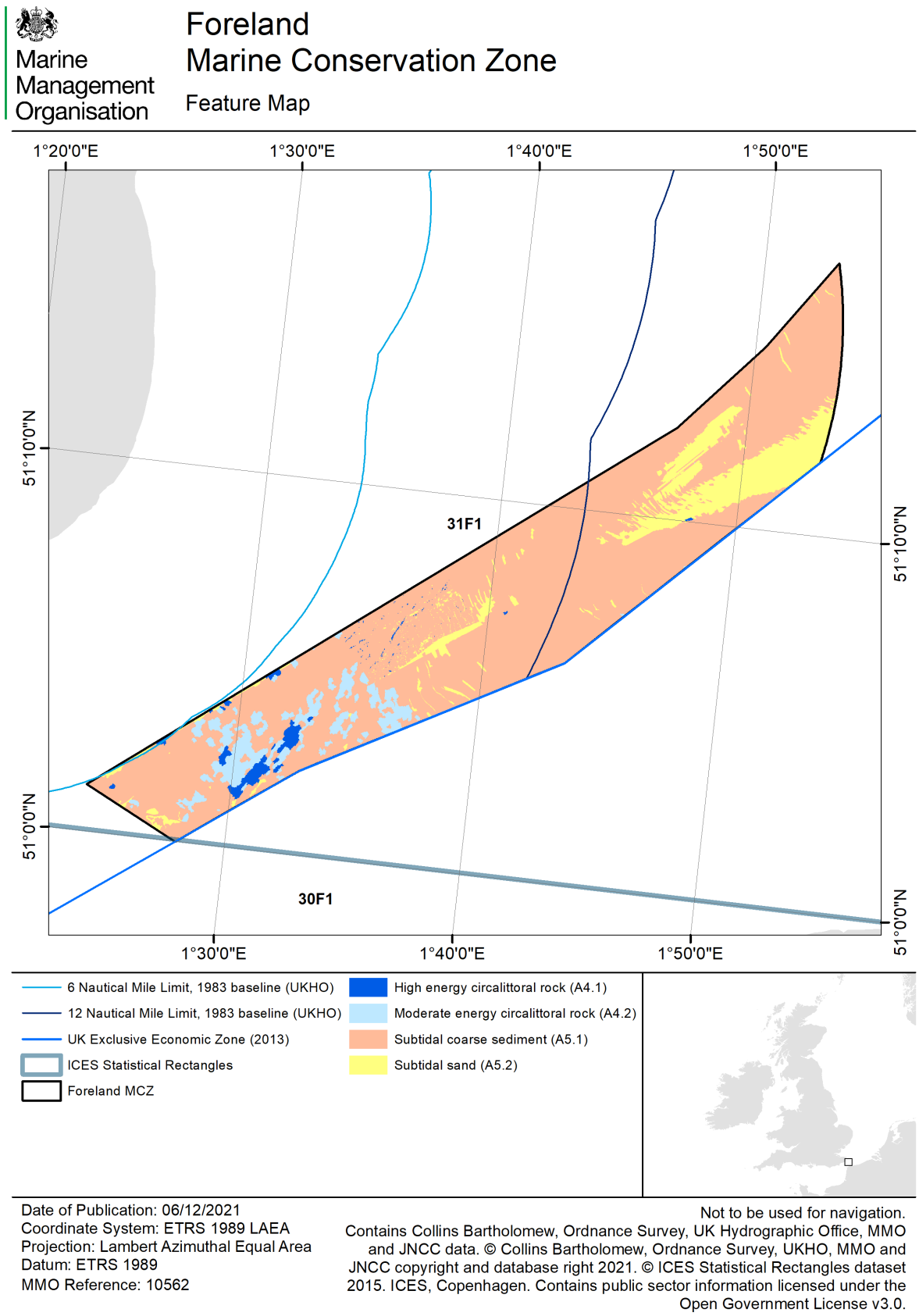

Figure 9: Foreland MCZ location and designated feature distribution.

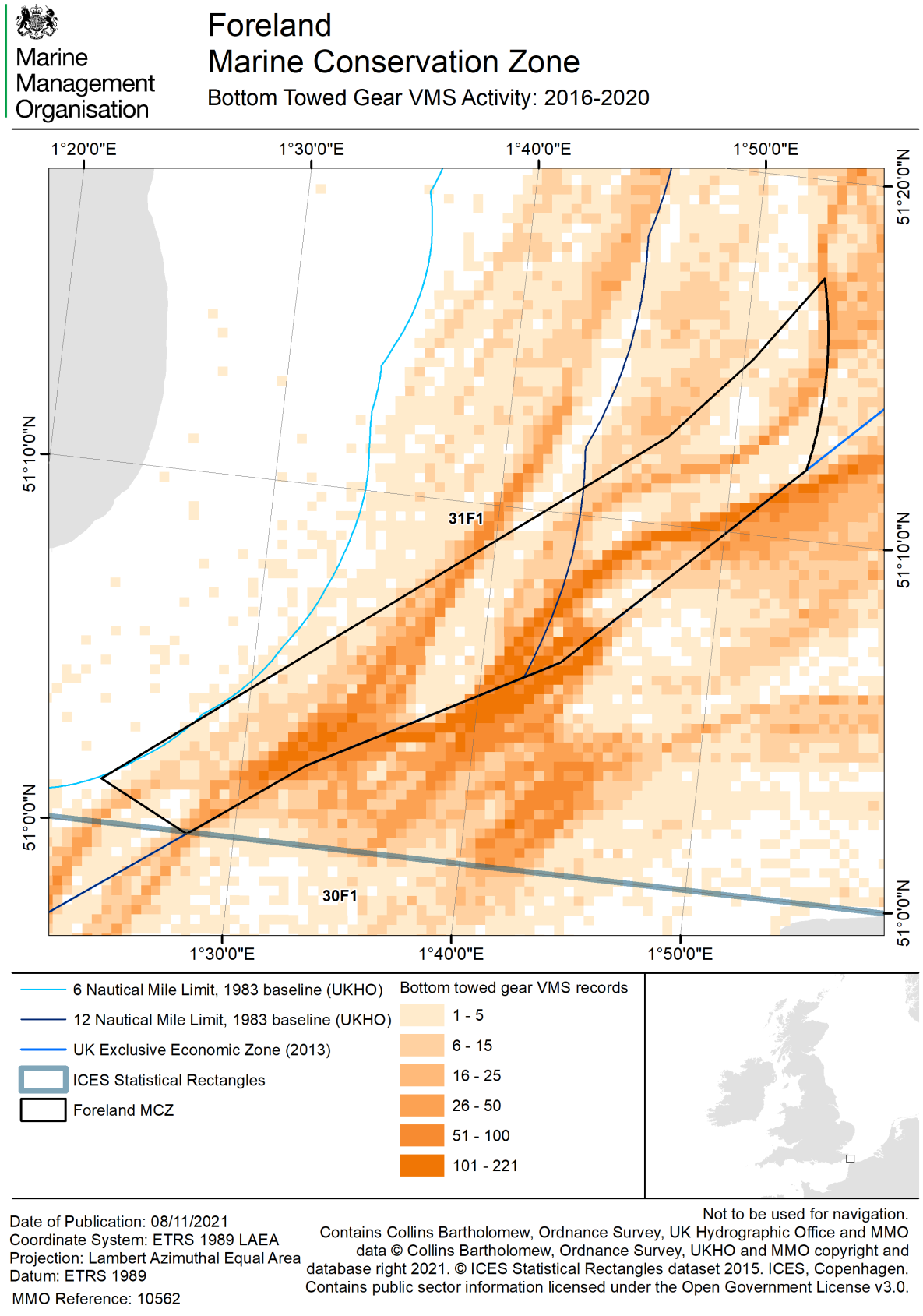

Figure 10: Foreland MCZ VMS activity from bottom towed gear from 2016-2020.

3.4.3. Fishing activity

VMS records show that bottom towed gear activity within the site is almost exclusively (99%) conducted by non-UK vessels. The majority of this fishing effort is from bottom otter trawling however demersal seining (particularly 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. Seining activity is concentrated primarily within the central and north-eastern section of the site, whilst trawling activity occurs throughout.

3.4.4. Fisheries impact assessment conclusion

As detailed in Figure 9, circalittoral rock in Foreland MCZ occurs in relatively small, isolated areas generally within the south portion of the site.

The VMS data (Figure 10) shows bottom towed gear activity is taking place over the protected rock features and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will lead to a significant risk of hindering the conservation objectives of the site.

3.5. Goodwin Sands MCZ

3.5.1. Designated site location

Goodwin Sands MCZ is located off Sandwich Bay on the coast of Kent and is approximately 277 km^2 in area (Figure 11).

It is a joint inshore and offshore site and fishing in the site is regulated by Kent and Essex Inshore Fisheries and Conservation Authority (0-6 nm) and MMO (>6 nm) and its relevant SNCB is NE (0-12 nm). There is no direct management of the MCZ by Kent and Essex IFCA or MMO, however the following Kent and Essex IFCA byelaws may impact upon the use of bottom towed gear within the site:

- *Vessel size and engine power byelaw* which prohibits vessels greater than 17 metres in length from fishing within the District and vessels with and engine power greater than 221 kilowatts (kW) (or 243kW before derating) from using towed gear.
- *Dredging for mussels* restricting the methods by which fishers can dredge for mussels within a given area of the District.
- *Dredging for scallops* restricting the methods by which fishers can dredge for scallops within a given area of the District.
- *Limitation on quantities and minimum size of mussels* limits the maximum fishing effort and minimum size a mussel can be removed from the fishery.
- *Small mesh trawl nets* giving the Authority the power to restrict the use of trawl nets below a certain mesh size.

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

3.5.2. Designated features

Goodwin Sands MCZ was formally designated in May 2019.

The site contains a number of features, including moderate energy circalittoral rock and Ross worm (*Sabellaria spinulosa)* reefs.

Animal-dominated moderate energy circalittoral rock is found primarily on shaded vertical rock faces within the eastern and southern sections of the site. This feature supports a range of species including bryozoans, pink sea fans, cup corals, anemones, soft corals, sponges, sea squirts and red algaes, as well as commercially important shellfish and fish. The distribution of *S. spinulosa* depends upon the underlying habitat and these species are often co-located with coarse sediment.

Subtidal sand and subtidal coarse sediments occur throughout the site, and the distribution of subtidal sand is particularly concentrated in the west of the site where it makes up the Goodwin Sands themselves. These subtidal sediments are home to a range of species including flatfish, polychaetes, and bivalve molluscs. In particular, blue mussels occur in the south of the site and are themselves a designated feature of the MCZ. The site also includes designation for English Channel outburst flood features. These are evidence of a megaflood that occurred approximately 200,000 years ago leading to the separation of England from mainland Europe. The features being assessed within this document are displayed in Table 7.

This assessment considers the interaction between bottom towed fishing gears and the moderate energy circalittoral rock and the Ross worm (*Sabellaria spinulosa*) reef features. For the purposes of this assessment, Ross worm (*Sabellaria spinulosa)* reef features will be treated in the same way as Annex I reef: biogenic features detailed throughout the assessment. The remaining features and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 11 shows the distribution of designated features within the MCZ. Table 7 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 7: Conservation objectives for designated features of the Goodwin Sands MCZ[23] with the features currently assessed highlighted in green.

Designated feature	Conservation objective
English Channel outburst flood features	Subject to natural change, remain in favourable condition, meaning that: • Its extent is stable or increasing; and • Its structure and functions, its quality, and the composition of its characteristic biological communities (including the diversity and abundance of species forming part of or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate. • Any temporary deterioration in condition of a habitat feature is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery. • Any alteration to that feature brought about entirely by natural processes is to be disregarded.
Subtidal coarse sediment	
Subtidal sand	
Blue mussel beds*	
Moderate energy circalittoral rock	Subject to natural change, be brought into favourable condition, meaning that: • Its extent is stable or increasing; and • Its structure and functions, its quality, and the composition of its characteristic biological communities (including the diversity and abundance of species forming part of or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate. • Any temporary deterioration in condition of a habitat feature is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery. • Any alteration to that feature brought about entirely by natural processes is to be disregarded.
Ross worm (*Sabellaria spinulosa*) reefs	

*Blue mussel beds were designated with a maintain general management approach, however the conservation advice package indicates that some attributes have restore/recover targets.

[23] https://www.gov.uk/government/publications/marine-conservation-zones-goodwin-sands

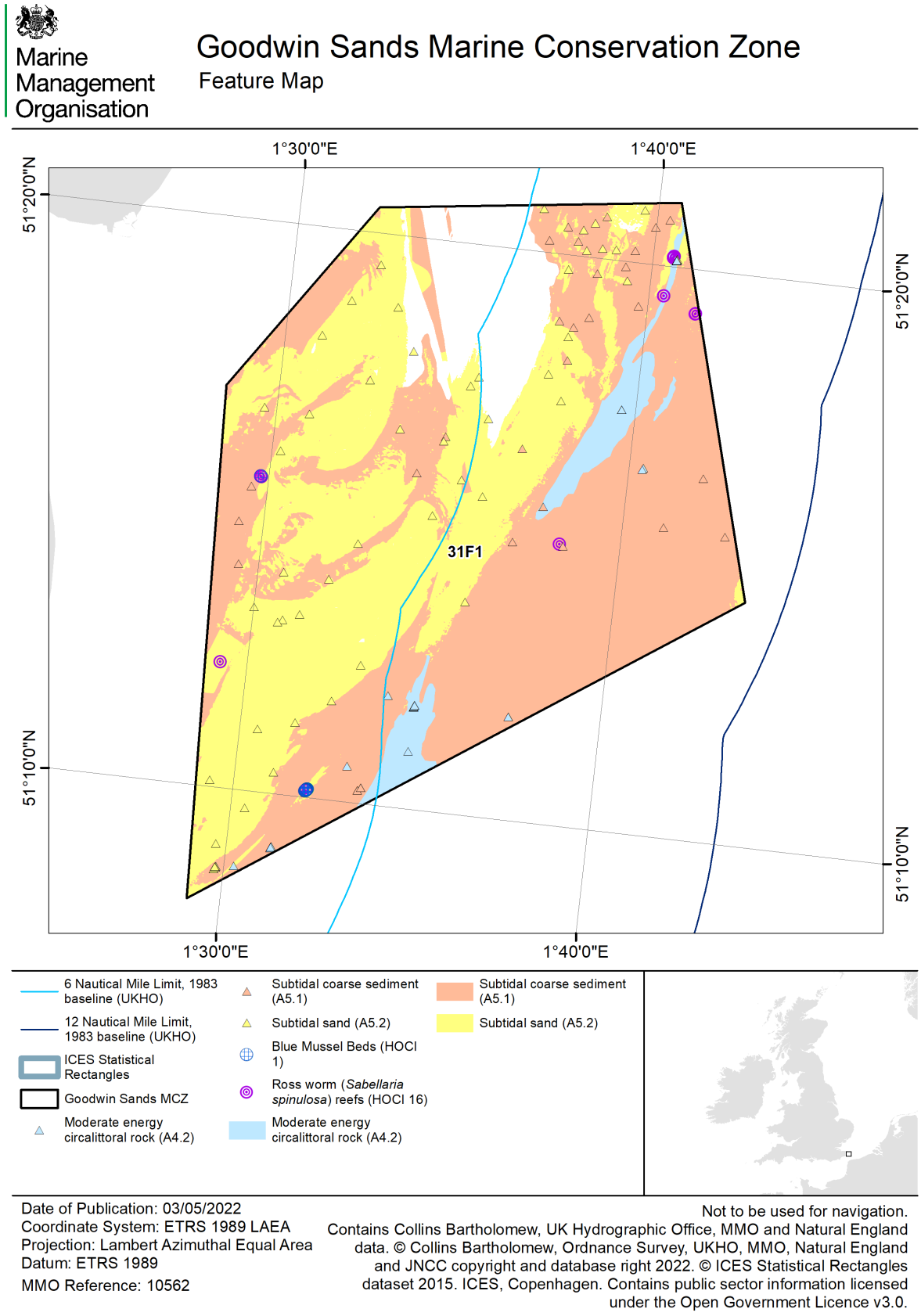

Figure 11: Goodwin Sands MCZ location and designated feature distribution.

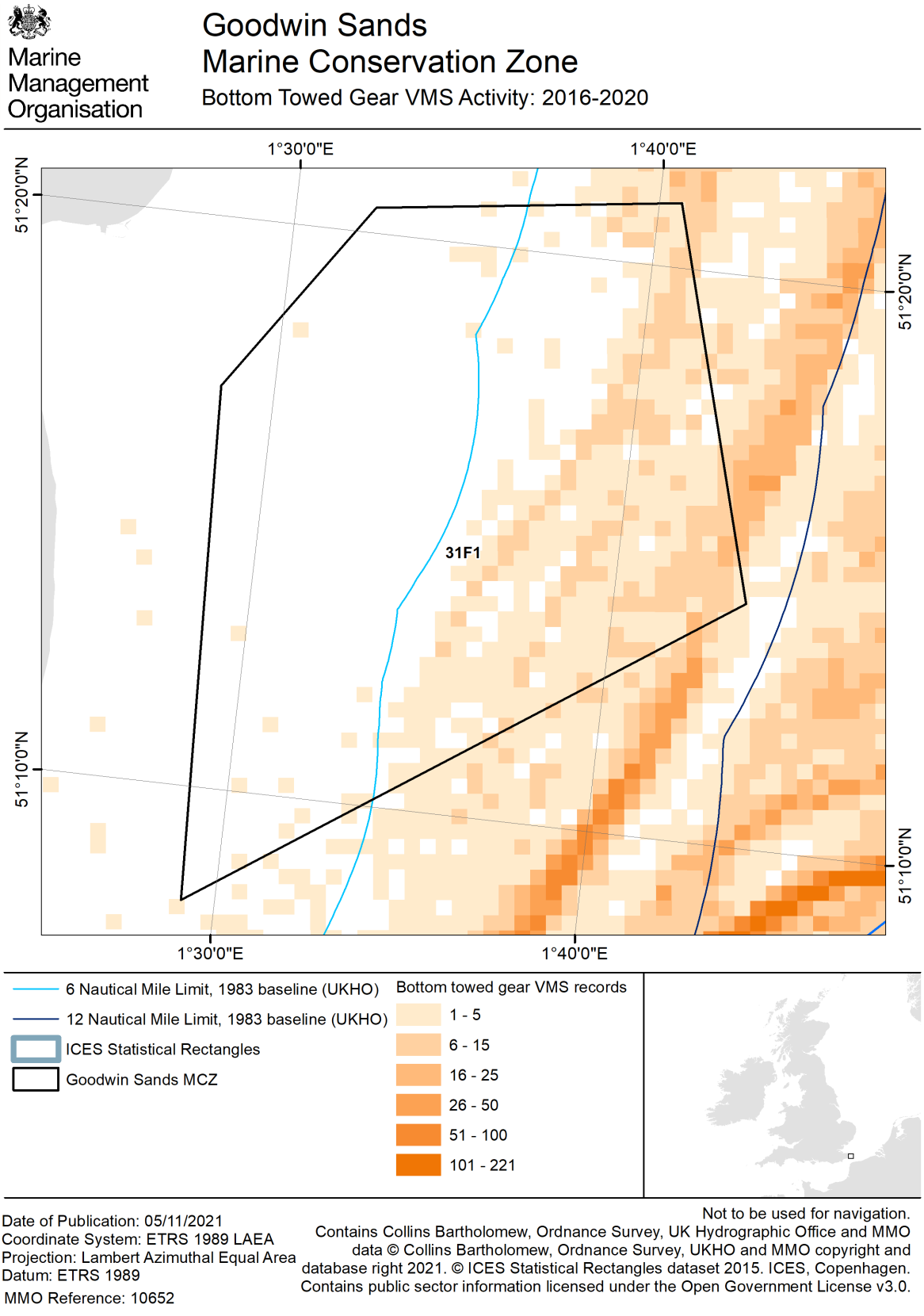

Figure 12: Goodwin Sands MCZ VMS activity from bottom towed gear from 2016-2020.

3.5.3. Fishing activity

VMS records show that known bottom towed fishing gear activity occurs primarily in the eastern section of the site. Fishing activity within the site is attributed approximately equally to UK vessels (50%) and non-UK vessels (50%). The majority of all 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.

3.5.4. Fisheries impact assessment conclusion

As detailed in Figure 11, moderate energy circalittoral rock in Goodwin Sands MCZ occurs in discrete areas located both within the northern and southern sections of the site. *Sabellaria spinulosa* reef occurs throughout the MMO section of the site, often in close proximity to moderate energy circalittoral rock.

The VMS data (Figure 12) shows bottom towed gear activity is taking place over the moderate energy circalittoral rock and *S. spinulosa reef* features and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will lead to a significant risk of hindering the conservation objectives of the site.

3.6. Haig Fras SAC

3.6.1. Designated site location

Haig Fras SAC is located 95 km north-west of the Isles of Scilly, an isolated underwater granite rock outcrop in the Celtic Sea and protects an area of approximately 476 km^2 (Figure 13).

3.6.2. Designated features

Haig Fras SAC was formally designated in December 2015 due to the presence of Annex I reef: rocky habitat, specifically bedrock reef (consolidated rock which creates a habitat that can be colonised by different marine animals and plants).

It is the only recorded substantial area of rocky reef in the Celtic Sea beyond the coastal margin and inshore waters. It supports a variety of fauna ranging from jewel anemones and solitary corals near the peak of the outcrop to encrusting sponges, crinoids, and Ross coral colonies towards the base of the rock (where boulders surround its edge). The area of reef feature within the site boundary is approximately 175 km^2. The rock type is granite, mostly smooth with occasional fissures, approximately 45 km long and in one area rises to a peak which lies just 38 m beneath the sea surface. The surrounding seabed is approximately 118 m deep, with small, dispersed patches of rocky outcropping within the surrounding circalittoral sand and coarse sediment.

This assessment considers the interaction between bottom towed fishing gears and the reef feature. Outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 13 shows the distribution of designated features within the SAC. Table 8 shows the designated features of the SAC and related conservation objectives for the individual features.

Table 8: Conservation objectives for designated features of the Haig Fras SAC[24] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
Reefs	For the feature to be in favourable condition thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Annex I reefs. This contribution would be achieved by restoring, subject to natural change: • The extent and distribution of the qualifying habitat in the site; • The structure and function of the qualifying habitat in the site; and • The supporting processes on which the qualifying habitat relies.

[24] Haig Fras MPA – Conservation Advice | JNCC Resource Hub

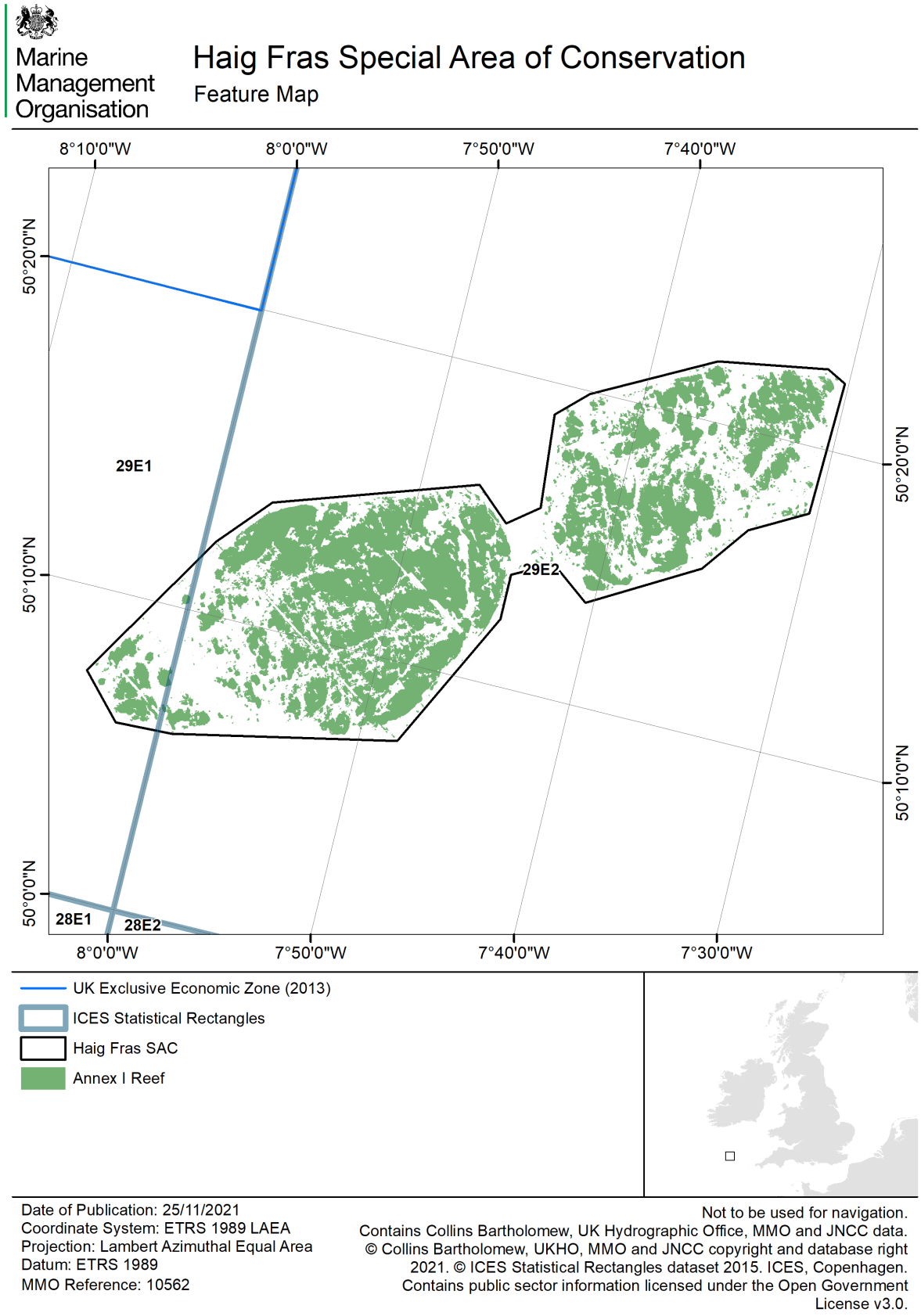

Figure 13: Haig Fras SAC location and designated feature distribution.

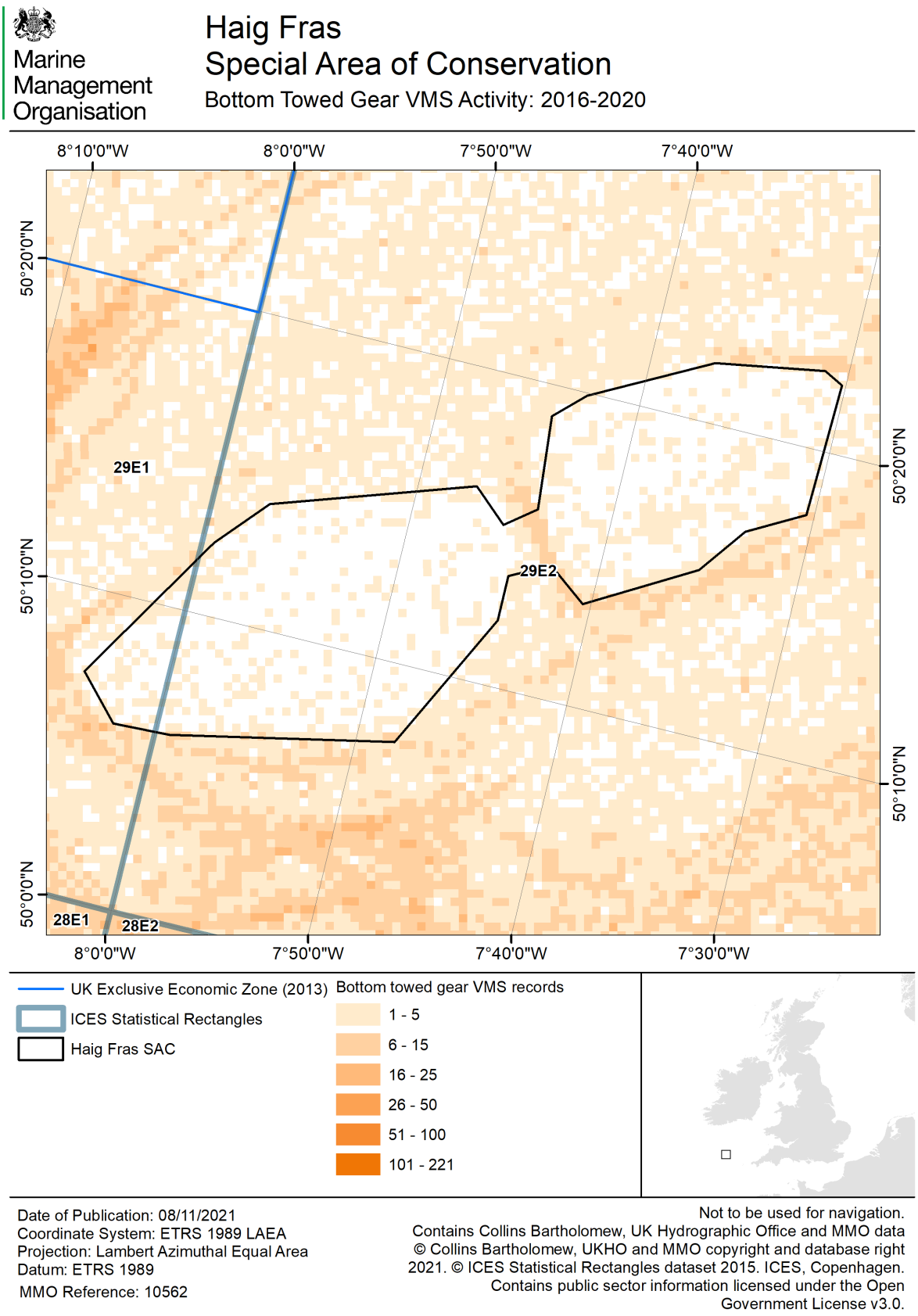

Figure 14: Haig Fras SAC VMS activity from bottom towed gear from 2016-2020.

3.6.3. Fishing activity

3.6.3. Fishing activity

VMS records show that bottom towed gear activity in the site is almost exclusively conducted by non-UK vessels (99%) particularly France and Ireland. Bottom otter trawls are most prevalent however some limited seining, including Danish (or anchor) and pair seining, also occur. Bottom towed gear activity appears to occur throughout the site however most occurs in the narrow middle section of the site.

3.6.4. Fisheries impact assessment conclusion

As detailed in Figure 13 the vast majority of the Haig Fras SAC consists of Annex I reef: rocky. The VMS data (Figure 14) shows bottom towed gear activity is taking place over the protected reef feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will likely result in an adverse effect on site integrity.

3.7. Haisborough, Hammond and Winterton SAC

3.7.1. Designated site location

The Haisborough, Hammond and Winterton SAC lies off the north east coast of Norfolk across the 6 nm limit and the 12 nm territorial sea limit. The site covers an area of approximately 1468 km^2 (Figure 15).

It is a joint inshore and offshore site and fishing within the site is regulated by Eastern Inshore Fisheries and Conservation Authority (0-6 nm) and MMO (>6 nm) and its relevant SNCBs are NE (0-12 nm) and JNCC (>12 nm).

Bottom towed fishing gear is already prohibited in some areas of the site via the Haisborough, Hammond and Winterton European Marine Site (Specified Areas) Bottom Towed Fishing Gear Byelaw[25].

There is no direct management of the SAC by Eastern IFCA, however the Eastern IFCA *Byelaw 3: molluscan shellfish methods of fishing* prohibits the use of fishing gear without authorisation from Eastern IFCA. Dredging activity anywhere in the District therefore requires prior consent from the Authority, which is only granted following an assessment of the environmental impact of the activity. More information on these byelaws can be found on Eastern IFCA's website. MMO will continue to engage directly with IFCAs regarding recommended management measures nearby/adjacent to their areas of jurisdiction.

[25] https://www.gov.uk/government/publications/haisborough-hammond-and-winterton-european-marine-site-specified-areas-bottom-towed-fishing-gear-byelaw

3.7.2. Designated features

The SAC was formally designated in September 2017 for the features ‘sandbanks which are slightly covered by sea water all the time’, and Annex I reef: biogenic (*Sabellaria spinulosa)*.

Sandbanks within the site vary from almost breaching the sea surface, down to a maximum depth of 52 m. The site contains a mosaic of different physical habitats with different biological communities. The fauna of the sandbank crests and flanks is predominantly low diversity polychaete (cat worm) and amphipod (shrimp-like crustacean) communities which are typical of mobile sediment environments. The troughs contain more gravelly sediments and support diverse infaunal and epifaunal communities with occurrences of reefs of the tube-building ross worm *Sabellaria spinulosa*. Aggregations of *S. spinulosa* provide additional hard substrate for the development of rich epifaunal communities.

The site contains important breeding and nursery grounds for young commercially important fish, including sandeels, which are an important prey item for several bird species. The stabilisation of sediments by reef features lead to a biodiversity hotspot. This site is one of only 12 sites in the UK that contains *S. spinulosa* reef as a designated feature.

This assessment considers the interaction between bottom towed fishing gears and the reef feature. The remaining feature (Sandbanks which are slightly covered by seawater all the time) and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 15 shows the distribution of designated features within the SAC. Table 9 shows the designated features of the SAC and related conservation objectives for the individual features.

Table 9: Conservation objectives for designated features of the Haisborough, Hammond and Winterton SAC[26] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
Sandbanks which are slightly covered by sea water all the time	For the feature to be in favourable condition thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Sandbanks which are slightly covered by sea water all the time. This contribution would be achieved by restoring, subject to natural change: • The extent and distribution of the qualifying habitat in the site; • The structure and function of the qualifying habitat in the site; and • The supporting processes on which the qualifying habitat relies.
Reefs	For the feature to be in favourable condition thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Reefs. This contribution would be achieved by restoring, subject to natural change: • The extent and distribution of the qualifying habitat in the site; • The structure and function of the qualifying habitat in the site; and • The supporting processes on which the qualifying habitat relies.

[26] Marine site detail (naturalengland.org.uk)

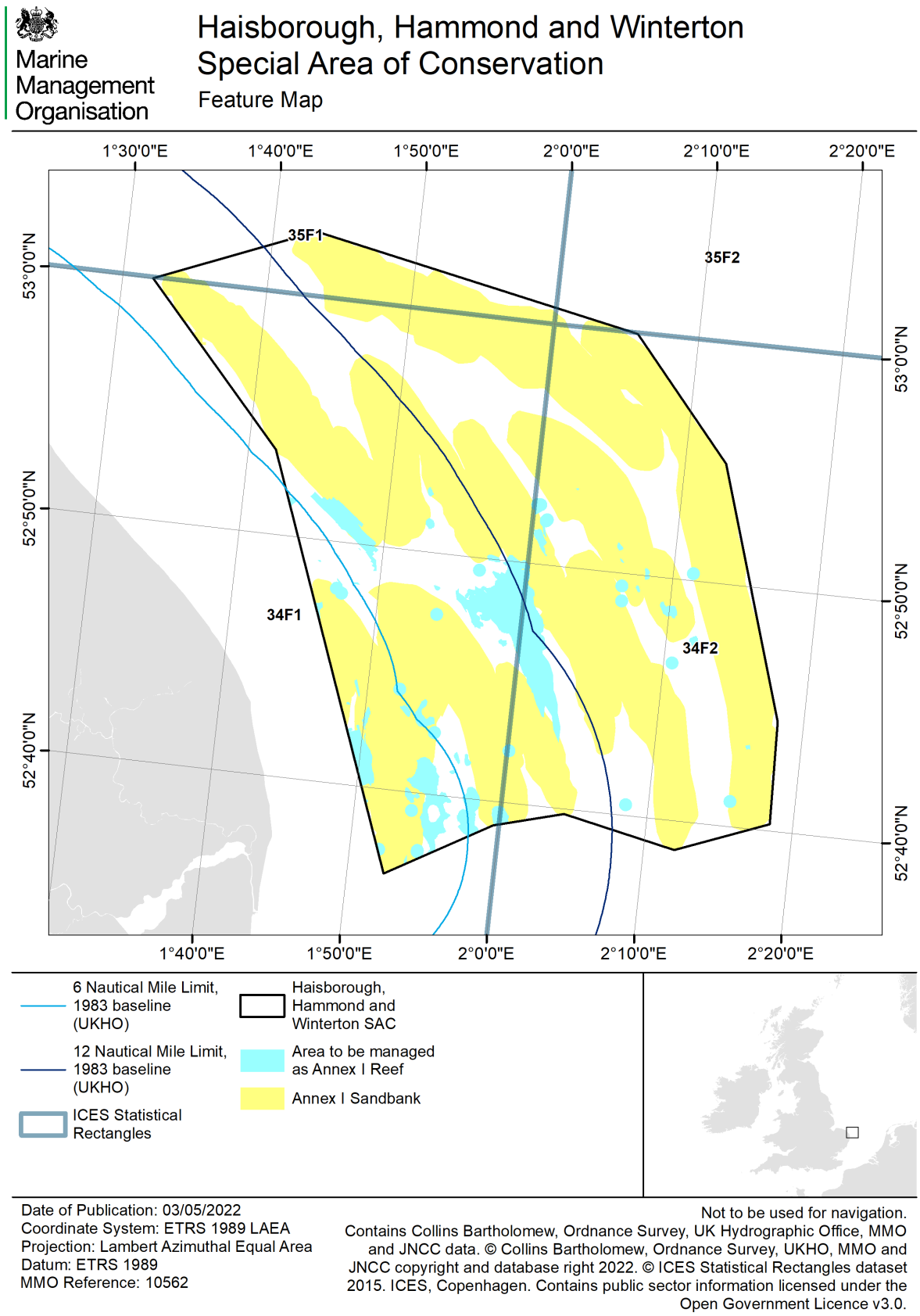

Figure 15: Haisborough, Hammond and Winterton SAC location and designated feature distribution.

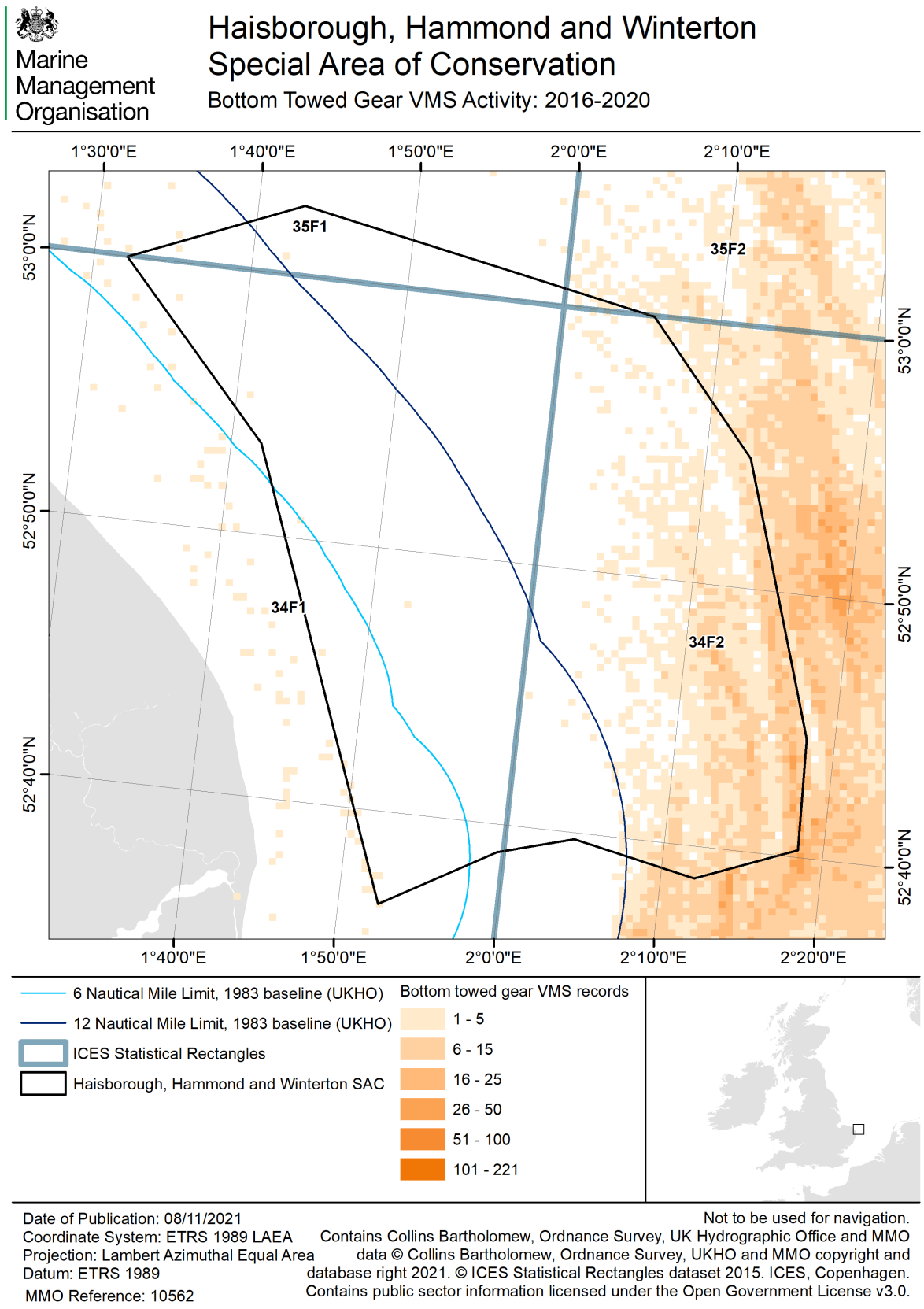

Figure 16: Haisborough, Hammond and Winterton SAC VMS activity from bottom towed gear from 2016-2020.

3.7.3. Fishing activity

VMS records show that bottom towed gear activity within the site is conducted almost exclusively (99.6%) by non-UK vessels, with the majority of activity occurring in the section of the site beyond the 12 nm limit. 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.

3.7.4. Fisheries impact assessment conclusion

As detailed in Figure 15, known areas of Annex I reef: biogenic in Haisborough, Hammond and Winterton SAC are distributed unevenly across the site in discreet patches, with the majority of known reef feature situated in the southern portion of the site. However, it is worth noting that lack of evidence of reef features in the north of the site may not necessarily suggest absence of reef in that area, but potentially a lack of monitoring in the northern half of the site.

While some areas of reef are protected in the current MMO byelaw, newly found reef areas and Annex I reef: biogenic outside of 12 nm are not. The VMS data (Figure 16) shows bottom towed gear activity is taking place over the protected reef feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will lead to an adverse effect on site integrity.

3.8. Hartland Point to Tintagel MCZ

3.8.1. Designated site location

Hartland Point to Tintagel MCZ is an inshore site on the North coast of Devon and Cornwall, in the Southwest of England. It extends from the shoreline, covering 304 km^2 and reaching depths of 50 m (Figure 17).

It is a cross-boundary inshore and offshore site and fishing within the site is regulated by Cornwall Inshore Fisheries and Conservation Authority, Devon and Severn IFCA (0-6 nm) and MMO (>6 nm) and its relevant SNCBs are NE (0-12 nm) and JNCC (>12 nm). There is no direct management of the MCZ by MMO, Cornwall IFCA or by Devon and Severn IFCA, however the following byelaws may impact upon the use of bottom towed gear within the site:

- Cornwall IFCA *Methods of Fishing (Dredges) Byelaw* defining gear specifications and other conditions for the use of dredges for fishing;
- Cornwall IFCA *Scallop Dredge (Limited Fishing Time) Byelaw* limiting the fishing time for scallop dredging;
- Cornwall IFCA *Shellfish Boats* limiting the overall length of vessels used to fish for shellfish; and
- Cornwall IFCA *Trawling* limiting the overall power and length of vessels fishing using a trawl.

- Devon and Severn IFCA *Mobile Fishing Permit Byelaw* establishing a permit system across the Devon and Severn IFC District for the use of bottom towed gear. Flexible permit conditions are associated with the byelaw containing gear and effort restrictions.

More information on these byelaws can be found on Cornwall IFCA's and Devon and Severn IFCA's respective websites. MMO will continue to engage directly with IFCA's regarding recommended management measures nearby/adjacent to their areas of jurisdiction.

3.8.2. Designated features

Hartland Point to Tintagel MCZ was formally designated in January 2016.

The MCZ protects a wide range of features from rocky habitat to soft sediment important both nationally and regionally to the MPA network. Most of the site contains rocky habitats in deeper waters (circalittoral rock) interspersed with sublittoral coarse sediments. The 0-6 nm portion of the site contains some of the finest reef-building tubeworm (honeycomb worm, *Sabellaria alveolata*) populations in Britain (Lieberknecht *et al*., 2011; Natural England, 2016). The MMO portion of the MCZ (6-12 nm) contains an area of subtidal sand in the north west but is mostly composed of subtidal coarse sediment and circalittoral rock. Large expanses of flat bed rock are present, either protruding through or covered by an overlaying layer of sediment of variable thickness. Not only does this make it difficult to differentiate between areas of rock and subtidal sediment across the site (Ware, 2016; Godsell, 2014; Green *et al.,* 2016) but it also makes it a more ideal habitat for fragile sponges and anthozoan communities. Fragile sponge and anthozoan communities on subtidal rocky habitats, a habitat of conservation importance (HOCI), have been recorded in both IFCA and MMO portions of the site in association with the circalittoral rock, subtidal course sediment and subtidal sand habitats.

Fragile sponge and anthozoan communities on subtidal rocky habitats are of national importance and are listed as a UK priority habitat and habitat of principal importance under the Natural Environment and Rural Communities Act 2006[27].

There are no records of pink sea fan in the MMO portion, but due to presence of this species within the IFCA portion of the site on the same habitats and similar depths as the MMO portion, this species has been considered in the impact pathway assessment (Table 10). The features assumed to be occurring within the MMO portion of the site are highlighted in green.

Although pink sea fans aren't included in NE's fisheries impact advice it is assumed, as pink sea fans are illustrative of fragile sponge and anthozoan communities on subtidal rocky habitat (HOCI) that impacts will be similar for both. NE and JNCC 'MCZ fisheries impact advice' also suggest the conservation objectives of fragile

[27] https://www.legislation.gov.uk/ukpga/2006/16/contents

sponge and anthozoan communities on subtidal rocky habitats will not be met with unrestricted access by bottom towed gear.

The pink sea fan is of national and international importance. It is listed on the IUCN's Red List as 'Vulnerable', and on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is a UK Priority Species and Species of Principal Importance under the Natural Environment and Rural Communities Act 2006[28], as well as a nationally scarce marine species. It is particularly vulnerable to bottom towed fishing activity as they grow very slowly in British waters, approximately 1 cm per year (Picton and Morrow, 2005).

This assessment considers the interaction between bottom towed fishing gears and the moderate and high energy circalittoral rock features. The remaining features and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites. Features located in the inshore portion of the site (0-6 nm) are outside the scope of MMO management and will be managed accordingly by the relevant IFCAs.

Figure 17 shows the distribution of designated features within the MCZ. Table 10 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 10: Conservation objectives for designated features of the Hartland Point to Tintagel MCZ[29] with the features currently assessed highlighted in green.

Designated feature	Conservation objective
High energy circalittoral rock	Be brought into favourable condition, meaning that- • Its extent is stable or increasing • Its structure and functions, its quality, and the composition of its characteristic biological communities (including diversity and abundance of species forming part or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate. • Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.
Moderate energy circalittoral rock	
Subtidal coarse sediment	
Subtidal sand	
Moderate energy infralittoral rock	Maintained in favourable condition, meaning that- • Its extent is stable or increasing • Its structure and functions, its quality, and the composition of its characteristic biological communities (including diversity and abundance
High energy infralittoral rock	
Coastal saltmarsh and saline reedbed (0-6 nm)	

[28] https://www.legislation.gov.uk/ukpga/2006/16/contents

[29] Marine site detail (naturalengland.org.uk)

Low energy intertidal rock (0-6 nm)	of species forming part or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate. • Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.
Moderate energy intertidal rock (0-6 nm)	
High energy intertidal rock (0-6 nm)	
Intertidal coarse sediment (0-6 nm)	
Intertidal sand and muddy sand (0-6 nm)	
Fragile sponge and anthozoan communities on subtidal rocky habitats	Be brought into favourable condition, meaning that- • Its extent is stable or increasing • Its structure and functions, its quality, and the composition of its characteristic biological communities (including diversity and abundance of species forming part or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate. • Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.
Pink sea-fan (*Eunicella verrucosa*)	Be brought into favourable condition and remain in such condition, meaning that, the population within a zone is supported in numbers which enable it to thrive, by maintaining: • The quality and quantity of its habitat • The number, age, and sex ratio of its population • Any temporary reduction of numbers of a species is to be disregarded if the population is sufficiently thriving and resilient to enable its recovery. Any alteration to a feature brought about entirely by natural processes is to be disregarded when determining whether a protected feature is in favourable condition.
Honeycomb worm (*Sabellaria alveolata*) reef (0-6 nm)	Maintained in favourable condition, meaning that- • Its extent is stable or increasing • Its structure and functions, its quality, and the composition of its characteristic biological communities (including diversity and abundance of species forming part or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate. • Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.

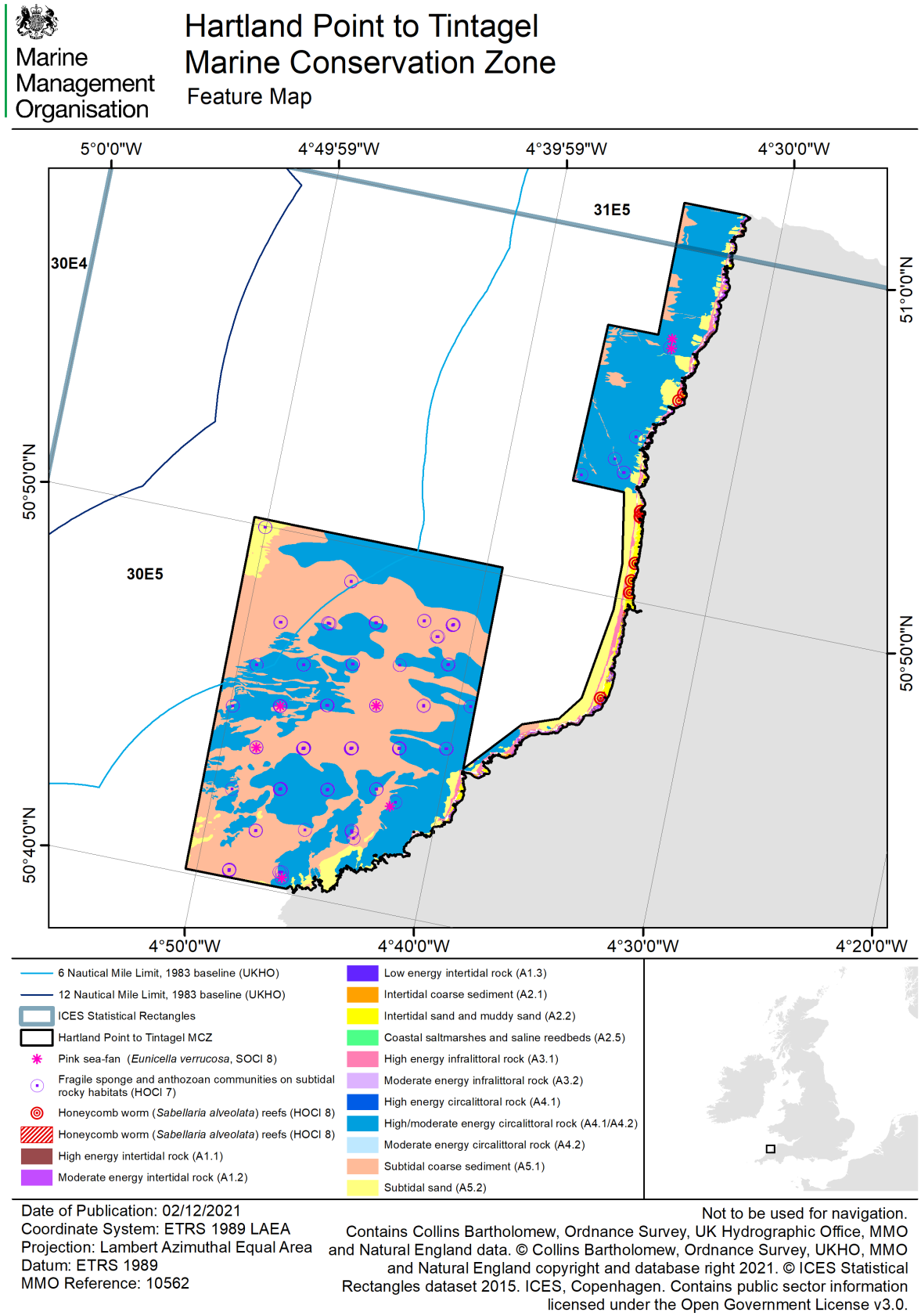

Figure 17: Hartland Point to Tintagel MCZ location and designated feature distribution

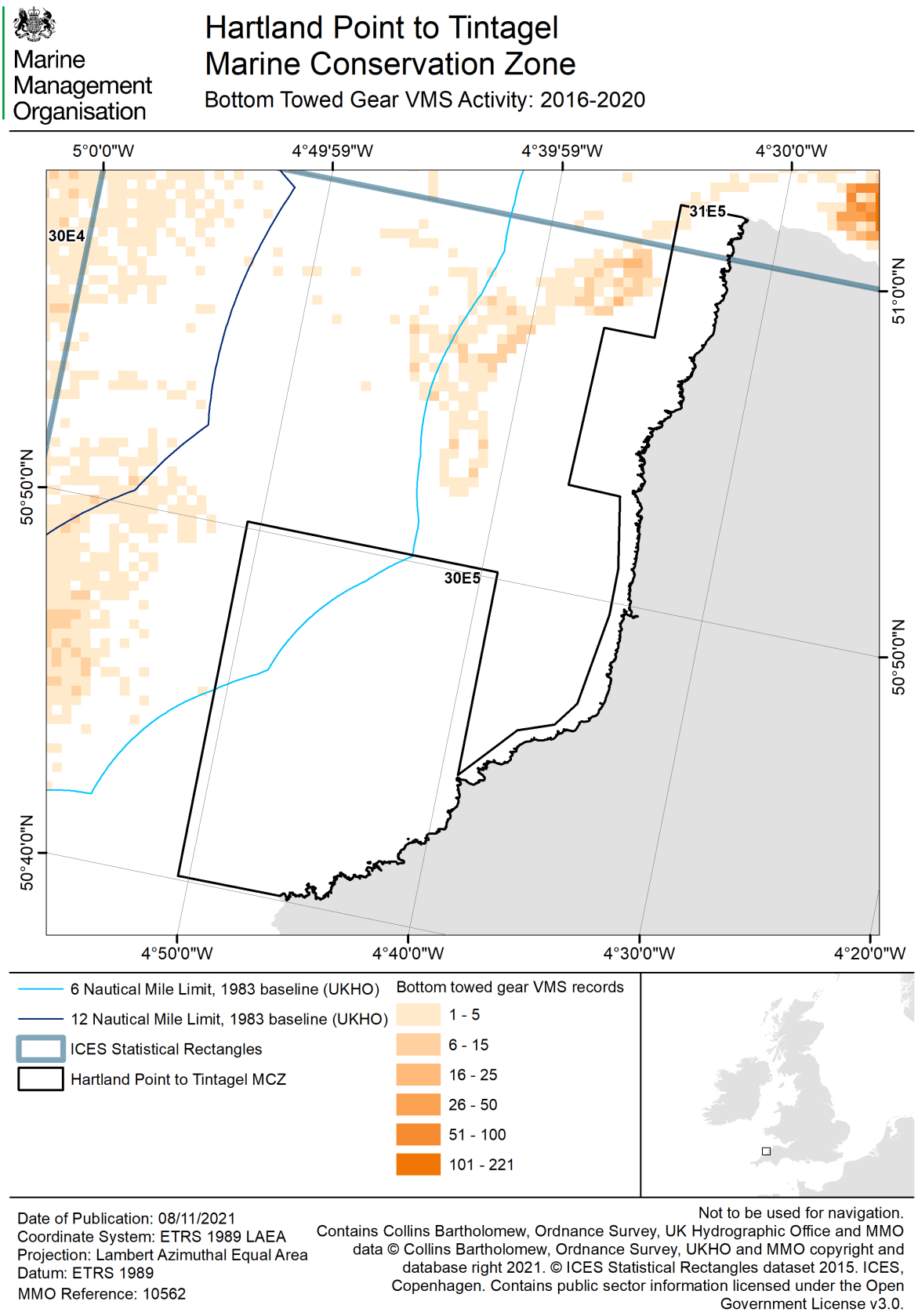

Figure 18: Hartland Point to Tintagel MCZ VMS activity from bottom towed gear from 2016-2020.

3.8.3. Fishing activity

No VMS reports were recorded from 2016 – 2020. However, reviewing sightings data and expert opinion, trawling occurs in small amounts over a small portion of MMO's portion of the MCZ with 0-10 trips per year, when weather/tides force fishermen inshore (along the 6 nm limit). Low intensity demersal trawling is undertaken by a few, small inshore UK vessels targeting plaice, ray, cuttlefish using bottom otter and beam trawl from vessels based outside of the Cornwall IFC District. There are limited areas where towed gear can be used in the MCZ. MMO's section of the site can be utilised under tides up to 7 m maximum and when appropriate weather conditions allow. No trawling currently occurs within Cornwall IFCA's section of the MCZ (within 0-6 nm). One vessel less than 12 m in length, from Devon and Severn IFC District, occasionally uses bottom towed gear in the MMO section of the MCZ. Most landings for the area are from outside of the MCZ. There is no evidence of EU vessels operating within the 6-12 nm section of the site.

3.8.4. Fisheries impact assessment conclusion

As detailed in Figure 17 there are significant areas of Hartland Point to Tintagel MCZ that consist of circalittoral rock for which the site is designated.

Although VMS data (Figure 18) does not show bottom towed gear activity is taking place in the 6-12 nm portion of the site, sightings data and expert opinion suggest low levels of bottom towed gear fishing activity from under 12 m vessels occurs within the 6-12 nm portion of the site. Given the evidence available MMO conclude the interaction of bottom towed gears with circalittoral rock, fragile sponge and anthozoan communities on subtidal rocky habitats and pink sea fans will lead to a significant risk of hindering the conservation objectives of the site.

3.9. Land's End and Cape Bank SAC

3.9.1. Designated site location

Land's End and Cape Bank SAC is found in the south west of England and lies to the west of the Land's End peninsula. The site extends to almost 22 km from the coast and protects an area of approximately 302 km^2 (Figure 19).

Land's End and Cape Bank SAC is a joint inshore and offshore site regulated by Cornwall Inshore Fisheries and Conservation Authority (0-6 nm) and MMO (>6 nm) and its relevant SNCBs are NE (0-12 nm) and JNCC (>12 nm). MMO are responsible for the management of the offshore 'Cape Bank' portion of the site.

Bottom towed gear is already prohibited in the majority of the Cape Bank portion of Land's End and Cape Bank SAC via the Land's End and Cape Bank European Marine Site (Specified Areas) Bottom Towed Gear Byelaw[30].

There is also direct management of the inshore Land's End section of the SAC by Cornwall IFCA via the Cornwall IFCA Closed Areas (European Marine Sites) No 2 Byelaw prohibiting the use of bottom towed fishing gear within a specified area.

The following byelaws may impact upon the use of bottom towed gear within the rest of the site:

- *Methods of Fishing (Dredges) Byelaw* defining gear specifications and other conditions for the use of dredges for fishing;
- *Scallop Dredge (Limited Fishing Time) Byelaw* limiting the fishing time for scallop dredging;
- *Shellfish Boats* limiting the overall length of vessels used to fish for shellfish; and
- *Trawling* limiting the power and overall length of vessels fishing using a trawl.

More information on these byelaws can be found on Cornwall IFCA's website. MMO will continue to engage directly with IFCA's regarding recommended management measures nearby/adjacent to their areas of jurisdiction.

3.9.2. Designated features

The site was designated in 2017 to protect Annex I reef: rocky features, including the sub-feature circalittoral rock.

The Cape Bank portion of the SAC overlaps the larger Cape Bank MCZ (Figure 19) which protects subtidal coarse sediment as well as moderate energy circalittoral rock, which can be treated as a subfeature of the Annex I reef: rocky protected in the SAC.

The reefs within the Land's End and Cape Bank SAC are completely submerged features composed almost entirely of granite. Their south westerly position on the British coast means they are exposed to strong tidal currents and oceanic swells coming in from the Atlantic Ocean. The Cape Bank region of the site is found in a fully marine environment with no major land-based sources of freshwater run-off.

The reef within the Cape Bank portion of the site is of particular conservation interest due to its highly biodiverse tide-swept communities including sponge, faunal and algal turf, and crustose communities.

This assessment considers the interaction between bottom towed fishing gears and the reef feature. Outstanding fishing gear interactions for this site will be assessed in

[30] https://www.gov.uk/government/publications/lands-end-and-cape-bank-european-marine-site-specified-areas-bottom-towed-gear-byelaw

the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 19 shows the distribution of designated features within the SAC. Table 11 shows the designated features of the SAC and related conservation objectives for the individual features.

Table 11: Conservation objectives for designated features of the Land's End and Cape Bank SAC[31] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
Reefs	Maintained or restored to favourable condition (please see section 2.2.5 for attribute information).

[31] Marine site detail (naturalengland.org.uk)

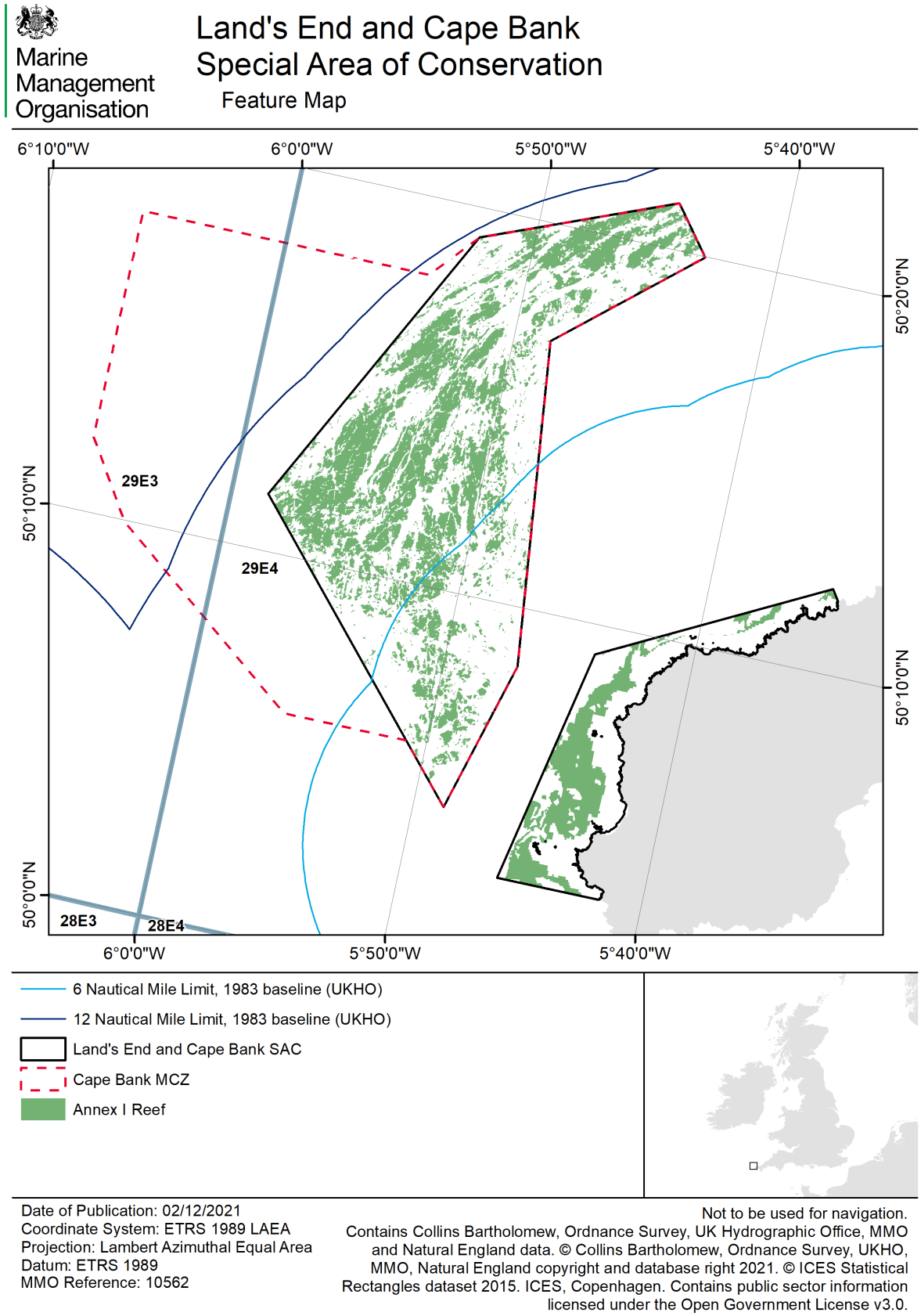

Figure 19: Land's End and Cape Bank SAC location and designated feature distribution.

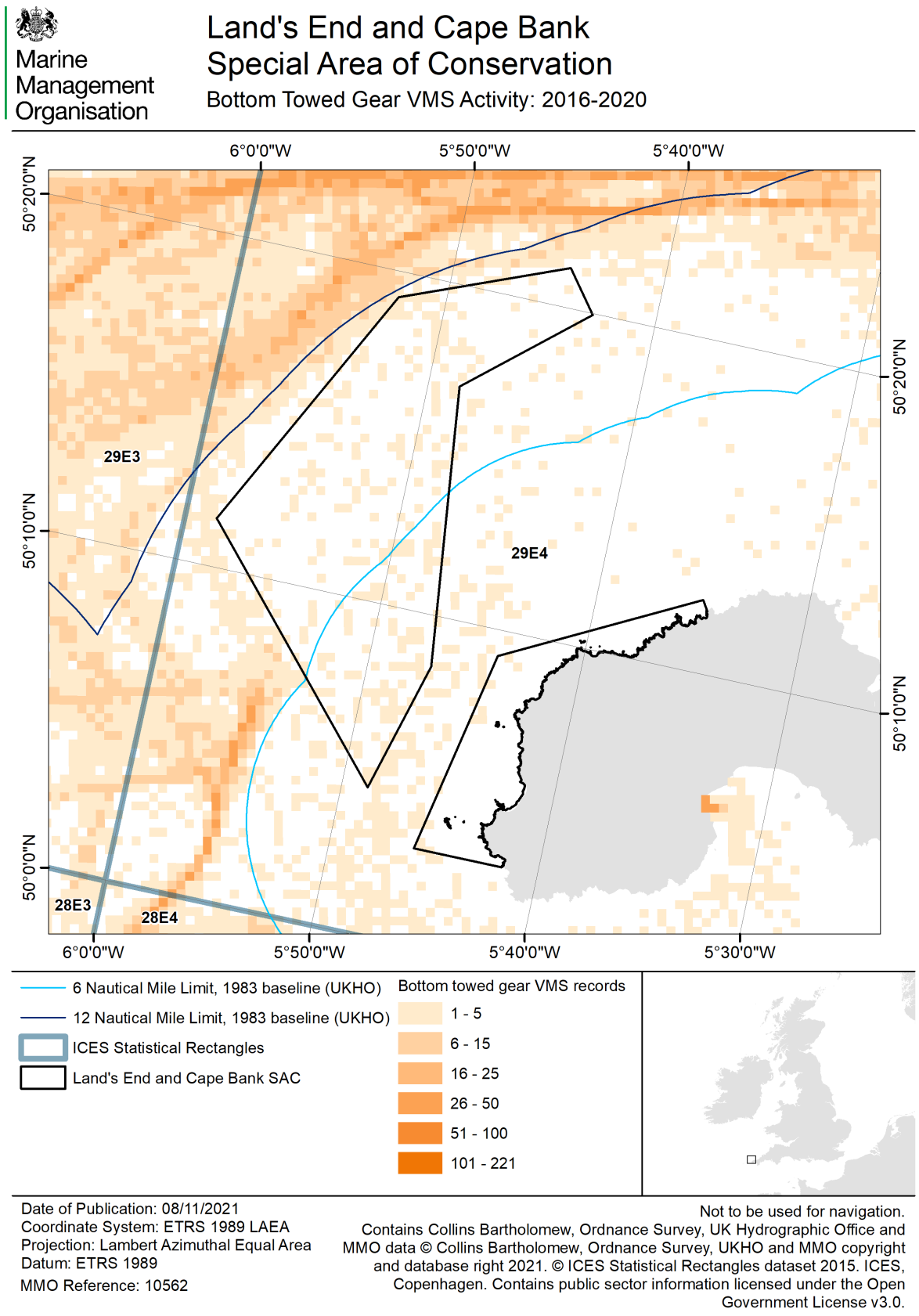

Figure 20: Land's End and Cape Bank SAC VMS activity from bottom towed gear from 2016-2020.

3.9.3. Fishing activity

The majority of the Cape Bank section of Land's End and Cape Bank SAC is already protected via the MMO Land's End and Cape Bank European Marine Site (Specified Areas) Bottom Towed Gear Byelaw[32] prohibiting bottom towed fishing gear activity. However, VMS records show evidence of 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.

3.9.4. Fisheries impact assessment conclusion

As detailed in Figure 19 the vast majority of the Cape Bank portion of Land's End and Cape Bank SAC consists of circalittoral rock which makes up the Annex I reef: rocky feature for which the site is designated.

The VMS data (Figure 20) shows bottom towed gear activity is taking place over the protected reef feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will result in an adverse effect on site integrity.

3.10. North Norfolk Sandbanks and Saturn Reef SAC

3.10.1. Designated site location

North Norfolk Sandbanks and Saturn Reef SAC is located in the southern North Sea covering an area of 3,603 km^2 (Figure 21).

3.10.2. Designated features

The SAC was formally designated in September 2017.

The SAC includes a series of ten main sandbanks and associated fragmented smaller banks, as a result of tidal processes, as well as several isolated patches of the Annex I reef: biogenic (*Sabellaria spinulosa)* feature within several distinct clusters across the site. A mosaic of these areas of the site will be treated as this feature. The sandbanks are the most extensive example of the offshore linear ridge sandbank type in UK waters and the site is viewed as one integrated sandbank system. The banks support communities of invertebrates which are typical of sandy sediments in the southern North Sea such as polychaete worms, isopods, crabs, and starfish.

[32] https://www.gov.uk/government/publications/lands-end-and-cape-bank-european-marine-site-specified-areas-bottom-towed-gear-byelaw

This assessment considers the interaction between bottom towed fishing gears and the reef feature. The remaining features (Sandbanks which are slightly covered by seawater all the time) and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 21 shows the distribution of designated features within the SAC. Table 12 shows the designated features of the SAC and related conservation objectives for the individual features.

Table 12: Conservation objectives for designated features of the North Norfolk Sandbanks and Saturn Reef SAC[33] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
Sandbanks which are slightly covered by sea water all the time	For the feature to be in favourable condition thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Sandbanks which are slightly covered by sea water all the time. This contribution would be achieved by restoring, subject to natural change: • The extent and distribution of the qualifying habitat in the site; • The structure and function of the qualifying habitat in the site; and • The supporting processes on which the qualifying habitat relies.
Reefs	For the feature to be in favourable condition thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Reefs. This contribution would be achieved by restoring, subject to natural change: • The extent and distribution of the qualifying habitat in the site; • The structure and function of the qualifying habitat in the site; and • The supporting processes on which the qualifying habitat relies.

[33] North Norfolk Sandbanks and Saturn Reef MPA – Conservation Advice | JNCC Resource Hub

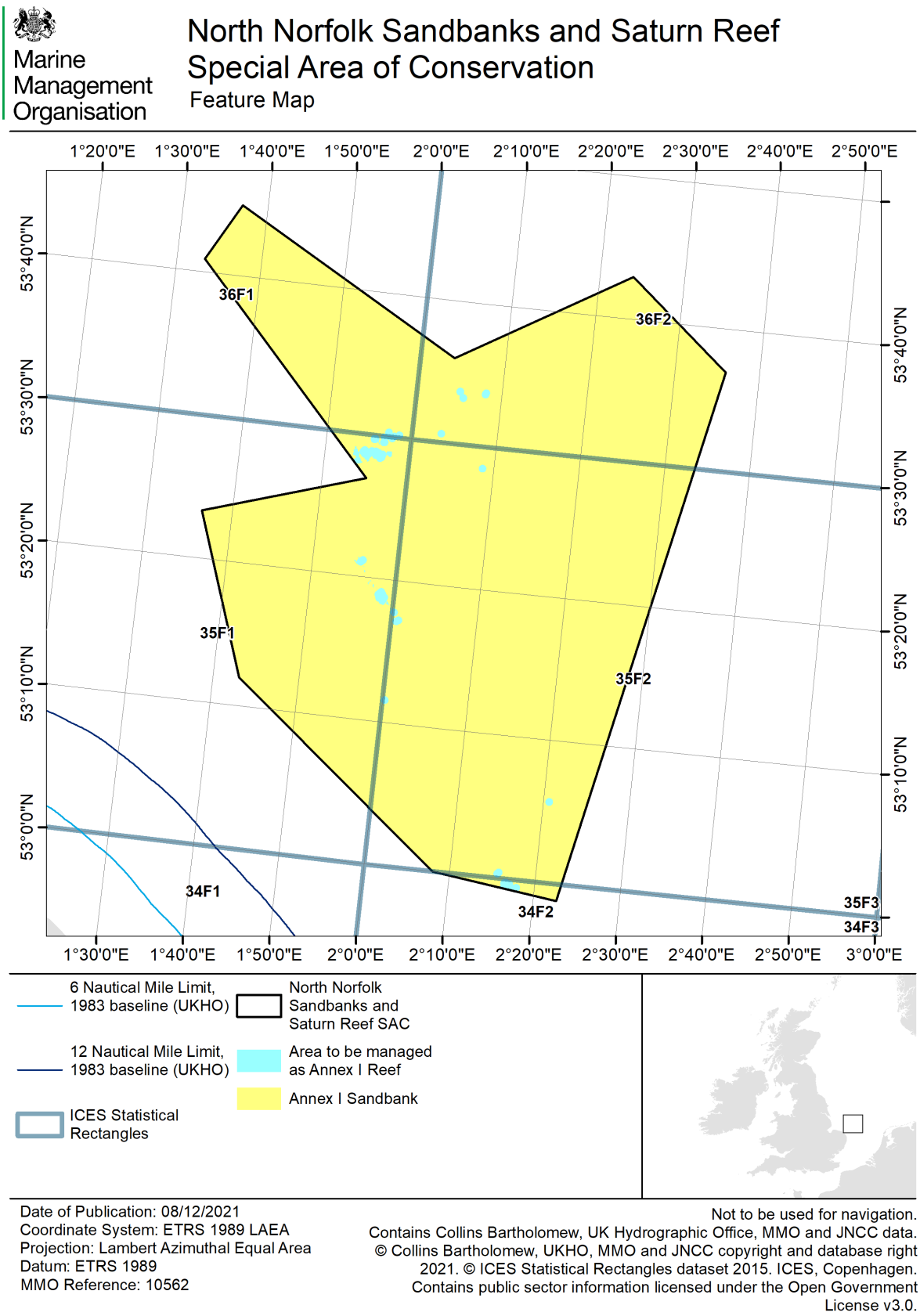

Figure 21: North Norfolk Sandbanks and Saturn reef SAC location and designated feature distribution.

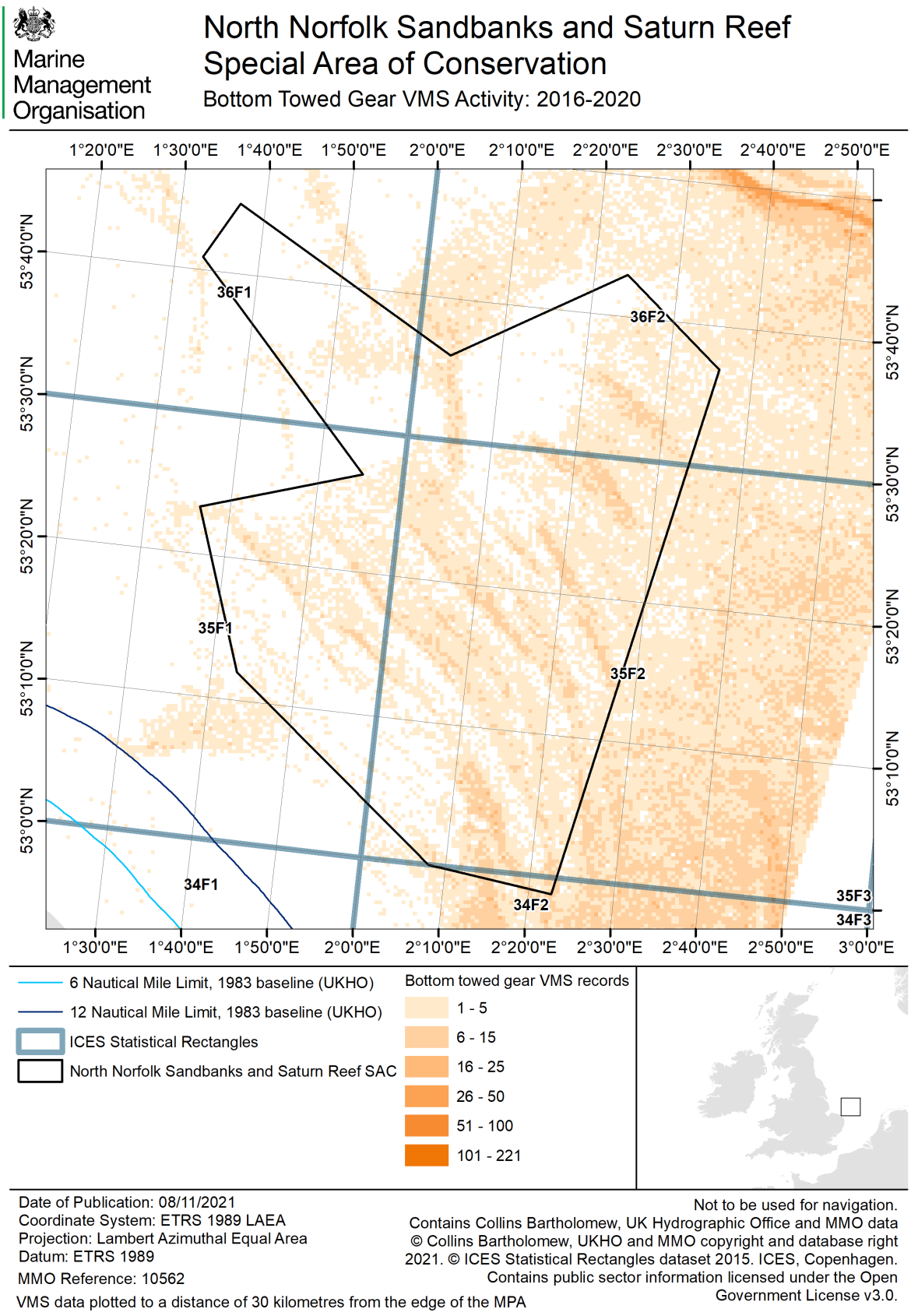

Figure 22: North Norfolk Sandbanks and Saturn Reef SAC VMS activity from bottom towed gear from 2016-2020.

3.10.3. Fishing activity

VMS records show that bottom towed gear activity within the site 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. There are also isolated incidences of seining from non-UK vessels. Activity is concentrated primarily within the south-eastern section of the site, alongside some activity in the centre and the north of the site.

3.10.4. Fisheries impact assessment conclusion

As detailed in Figure 21 Annex I reef: biogenic in North Norfolk Sandbanks and Saturn Reef SAC occurs in discreet areas within the site. The VMS data (Figure 22) shows bottom towed gear activity is taking place over the protected reef feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will lead to an adverse effect on site integrity.

3.11. Offshore Brighton MCZ

3.11.1. Designated site location

Offshore Brighton MCZ is located 45 km offshore, south of Selsey Bill, West Sussex in deep water of the mid-eastern English Channel due south of Brighton covering 861 km^2. South-eastern and south-western corners meet a median line with French waters (Figure 23).

3.11.2. Designated features

Offshore Brighton MCZ was formally designated in January 2016.

The site addresses an important national site network gap for circalittoral rock in the depth range 75-200m. This feature is present within a mosaic of habitats across the north and western portion of the site so this area of the site will be treated as this feature.

Offshore Brighton MCZ is made up of predominantly coarse sands and gravel with areas of exposed bedrock and mixed sediments. The deep-water rocks are dominated by animal communities and not plants due to the lack of sunlight. These include colourful sponges, a dense 'carpet' of sea firs, and the soft coral dead men’s fingers on rocky outcrops. Hydroids, bryozoans, and sponges colonise the boulders and cobbles, where hermit crabs and starfish also thrive. The site also includes coarse sediment supporting burying animals including shrimp-like creatures, burrowing anemones, carpet shell clams and venus cockle. The site also partially contains the Northern Paleovalley, a submerged ancient river system.

This assessment considers the interaction between bottom towed fishing gears and the high energy circalittoral rock feature. The remaining features and outstanding

fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 23 shows the distribution of designated features within the MCZ. Table 13 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 13: Conservation objectives for designated features of the Offshore Brighton MCZ[34] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
High energy circalittoral rock	Be brought into favourable condition, and remain in such condition, meaning that – • Extent is stable or increasing; and • Structures and functions, quality, and the composition of characteristic biological communities (which includes a reference to the diversity and abundance of species forming part of or inhabiting each habitat) are such as to ensure that they remain in a condition which is healthy and not deteriorating. • Any temporary deterioration in condition is to be disregarded if the habitats are sufficiently healthy and resilient to enable its recovery. • Any alteration to the features brought about entirely by natural processes is to be disregarded.
Subtidal coarse sediment	
Subtidal mixed sediment	

[34] Offshore Brighton MPA – Conservation Advice | JNCC Resource Hub

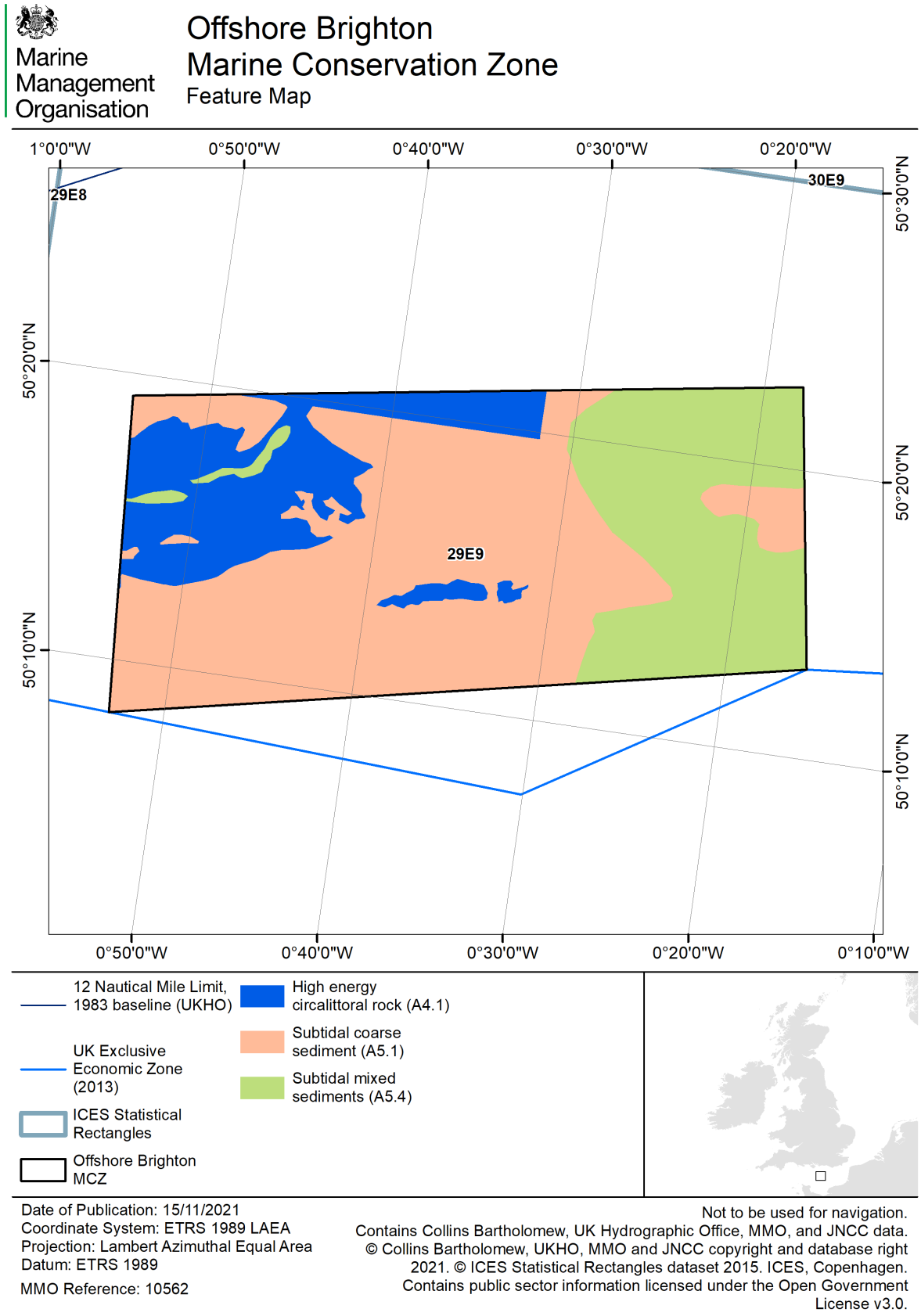

Figure 23: Offshore Brighton MCZ location and designated feature distribution.

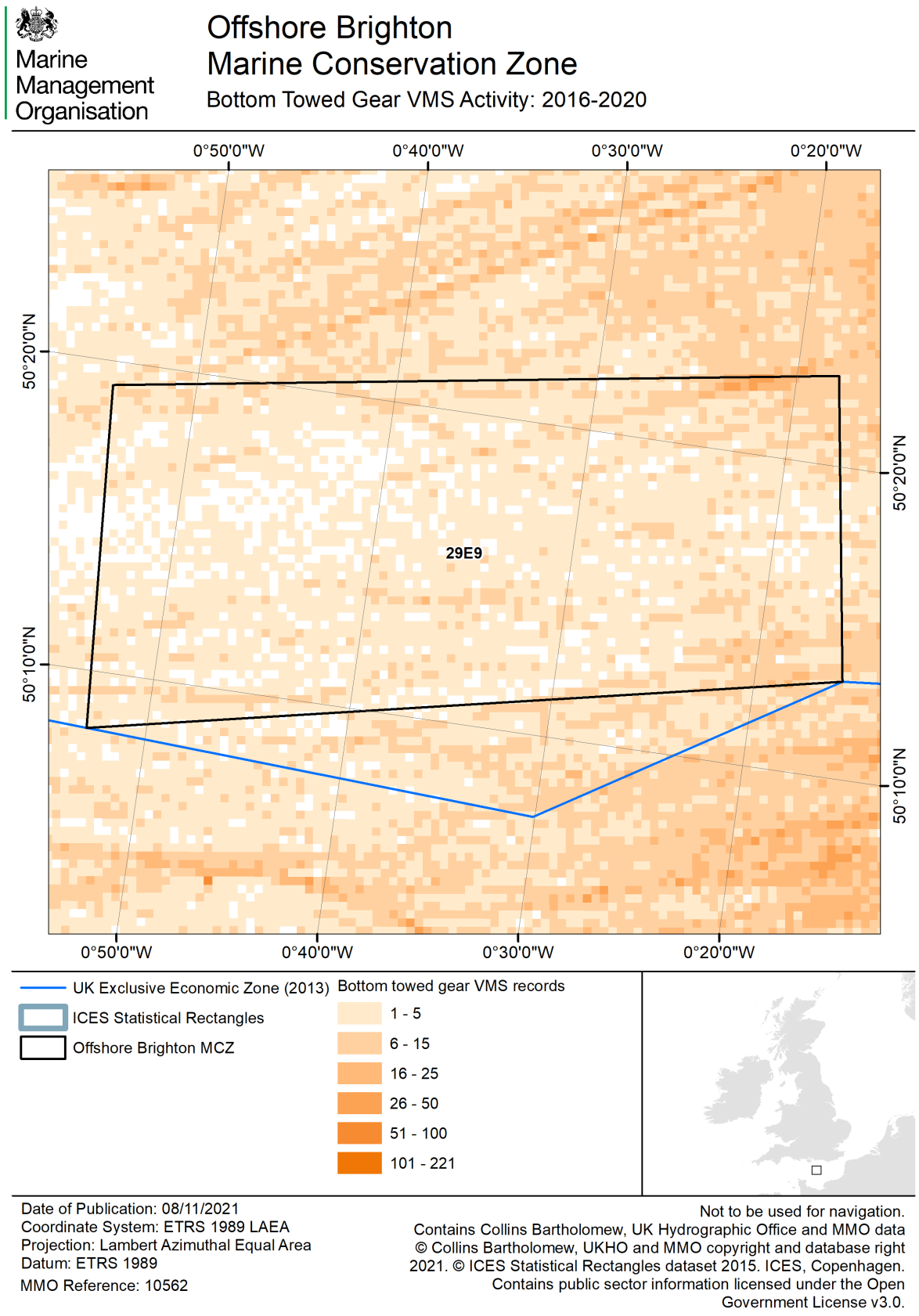

Figure 24: Offshore Brighton MCZ VMS activity from bottom towed gear from 2016-2020.

3.11.3. Fishing activity

VMS records show that bottom towed gear activity within the site 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. Bottom towed gear activity occurs throughout the site.

3.11.4. Fisheries impact assessment conclusion

As detailed in Figure 23, significant areas of circalittoral rock occur in the central and western portions of the site. The VMS data (Figure 24) shows bottom towed gear activity is taking place over the protected rock features and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will lead to a significant risk of hindering the conservation objectives of the site.

3.12. South of Celtic Deep MCZ

3.12.1. Designated site location

Celtic Deep MCZ is an offshore site located off the north coast of Cornwall, in the Western Channel and Celtic Sea. It covers an area of approximately 278 km². The site varies in depth between 50 and 100 metres, with two small areas dipping below 100 metres (Figure 25).

3.12.2. Designated features

South of Celtic Deep MCZ was formally designated in May 2019.

The site supports a variety of habitats ranging from rocky to sandy habitats. The depth of water across the site means that the amount of light reaching the seabed can be restricted, resulting in limited amounts of plant life and a seabed dominated by animal communities. The seabed is characterised by subtidal coarse sediment and subtidal sand, with small areas of subtidal mixed sediments and moderate energy circalittoral rock. This feature is present within a mosaic of habitats in the centre of the site so this area of the site will be treated as this feature. The seabed is highly heterogenous and this variety of habitats allows a range of species to thrive, such as starfish and haddock. The varied nature of the seabed means it could support a wide range of animals such as worms, bivalves, starfish, anemones, sea firs and sea urchins. This site makes an important contribution towards achieving the network targets for subtidal coarse sediment and subtidal sand. The site also increases the connectivity of sediment habitats protected within surrounding MPAs.

This assessment considers the interaction between bottom towed fishing gears and the moderate energy circalittoral rock features. The remaining features and outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 25 shows the distribution of designated features within the MCZ. Table 14 shows the designated features of the MCZ and related conservation objectives for the individual features.

Table 14: Conservation objectives for designated features of the South of Celtic Deep MCZ[35] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
Subtidal coarse sediment Subtidal sand Subtidal mixed sediments	Be brought into favourable condition, and remain in such condition, meaning that – • Its extent is stable or increasing; and • Its structures and functions, its quality, and the composition of its characteristic biological communities (which includes a reference to the diversity and abundance of species forming part of or inhabiting that habitat) are such as to ensure that it remains in a condition which is healthy and not deteriorating; • Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery. • Any alteration to that feature brought about entirely by natural processes is to be disregarded.
Moderate energy circalittoral rock	Remain in favourable condition, meaning that – • Its extent is stable or increasing; and • Its structures and functions, its quality, and the composition of its characteristic biological communities (which includes a reference to the diversity and abundance of species forming part of or inhabiting that habitat) are such as to ensure that it remains in a condition which is healthy and not deteriorating; • Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery. • Any alteration to that feature brought about entirely by natural processes is to be disregarded.

[35] South of Celtic Deep MCZ – Conservation Advice | JNCC Resource Hub

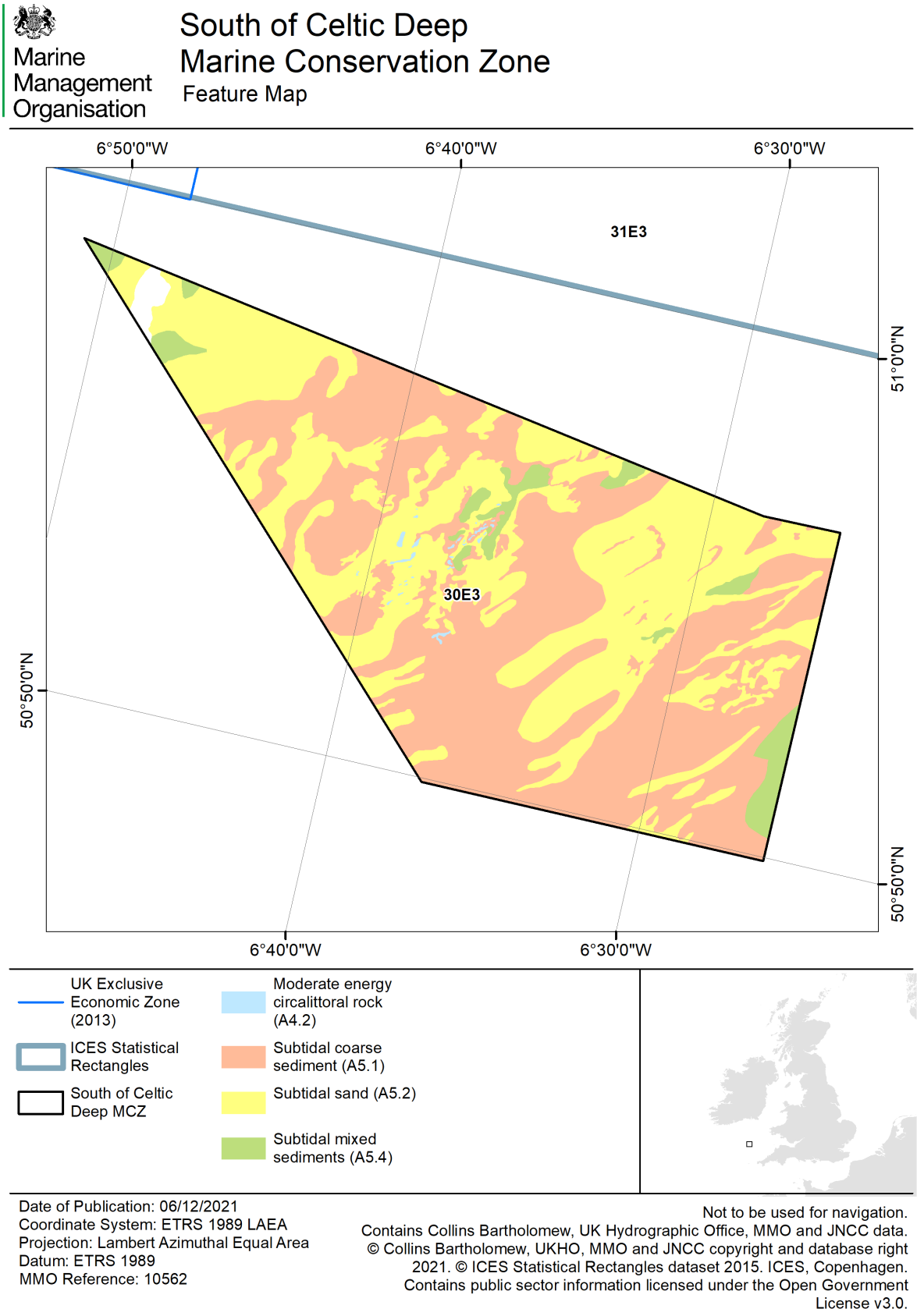

Figure 25: South of Celtic Deep MCZ location and designated feature distribution.

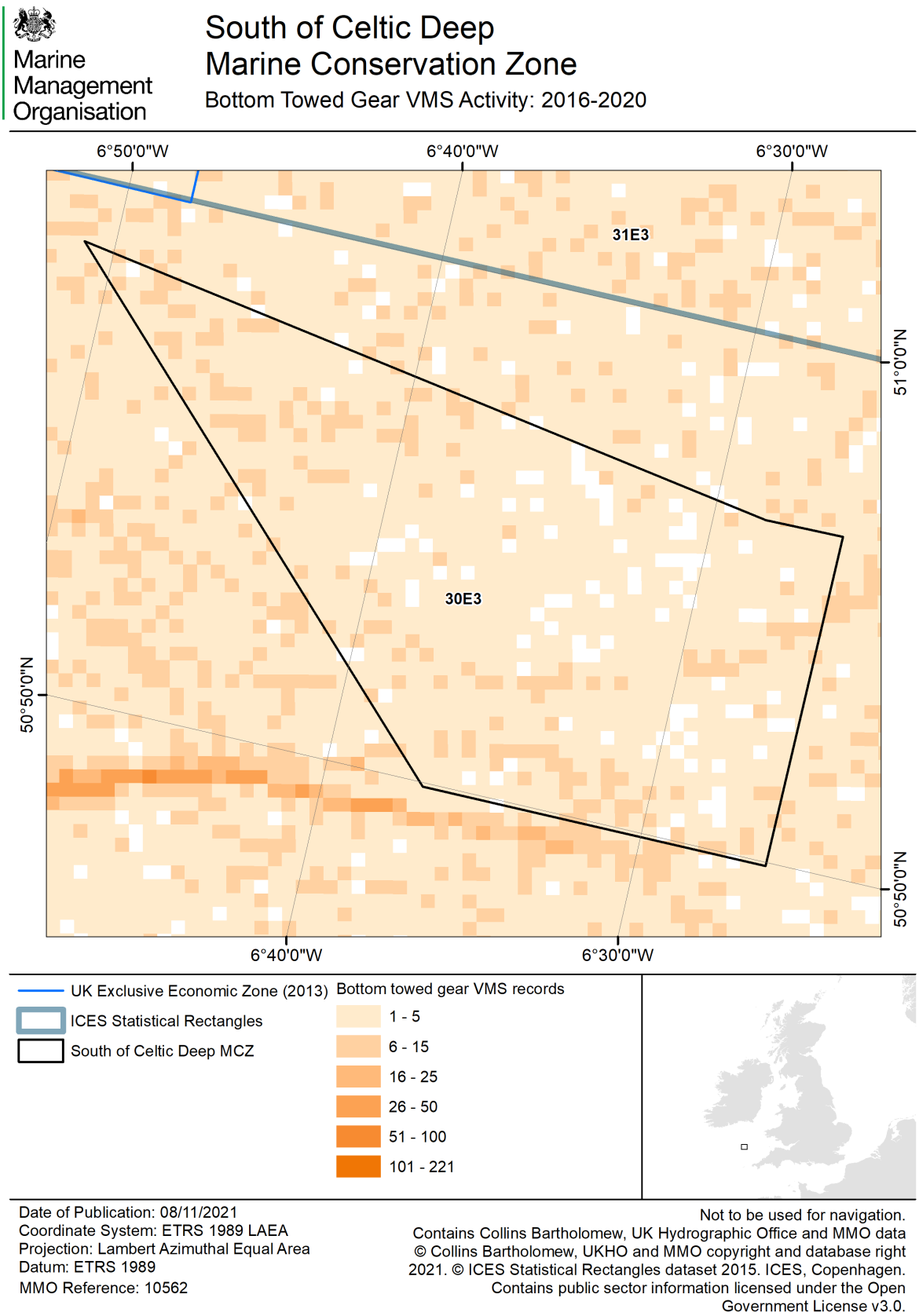

Figure 26: South of Celtic Deep MCZ VMS activity from bottom towed gear from 2016-2020.

3.12.3. Fishing activity

VMS records show bottom towed gear activity in the site mainly consists of non-UK vessels (83%) particularly Irish beam trawlers. However, some bottom otter trawling and dredging activity by non-UK vessels also occurs. UK vessels are active in the site with beam trawls the gear of choice, but this is in considerably lower intensities than that of EU fishing vessels.

3.12.4. Fisheries impact assessment conclusion

As detailed in Figure 25, circalittoral rock in South of Celtic Deep MCZ occurs in small, isolated areas within the site. The VMS data (Figure 26) shows bottom towed gear activity is taking place over the protected reef feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will lead to a significant risk of hindering the conservation objectives of the site.

3.13. Wight-Barfleur Reef SAC

3.13.1. Designated site location

Wight-Barfleur Reef SAC is an area of bedrock and stony reef located in the central English Channel, between St Catherine's point on the Isle of Wight and Barfleur Point on the Cotentin Peninsula in northern France. The site is approximately 65 km long (east to west) and up to 26 km wide (Figure 27).

3.13.2. Designated features

Wight-Barfleur SAC was formally designated in September 2017.

The SAC's Annex I reef: rocky habitats comprise of both bedrock reef (consolidated rock) and stony reef (cobbles and boulders) that support a diverse range of wildlife including sponges, tube worms, anemones, and sea squirts. The south-eastern area of the site contains part of a large geological feature known as a palaeochannel, which forms a major channel running roughly in a north-east to south-west direction across the English Channel.

This assessment considers the interaction between bottom towed fishing gears and the reef feature. Outstanding fishing gear interactions for this site will be assessed in the next stage of assessments, along with the remaining MMO-led sites, referred to as Stage 3 sites.

Figure 27 shows the distribution of designated features within the SAC. Table 15 shows the designated features of the SAC and related conservation objectives for the individual features.

Table 15: Conservation objectives for designated features of the Wight-Barfleur Reef SAC[36] with the feature currently assessed highlighted in green.

Designated feature	Conservation objective
Reefs	For the feature to be in favourable condition thus ensuring site integrity in the long term and contribution to Favourable Conservation Status of Reefs. This contribution would be achieved by restoring, subject to natural change: • The extent and distribution of the qualifying habitat in the site; • The structure and function of the qualifying habitat in the site; and • The supporting processes on which the qualifying habitat relies.

[36] Wight-Barfleur Reef MPA – Conservation Advice | JNCC Resource Hub

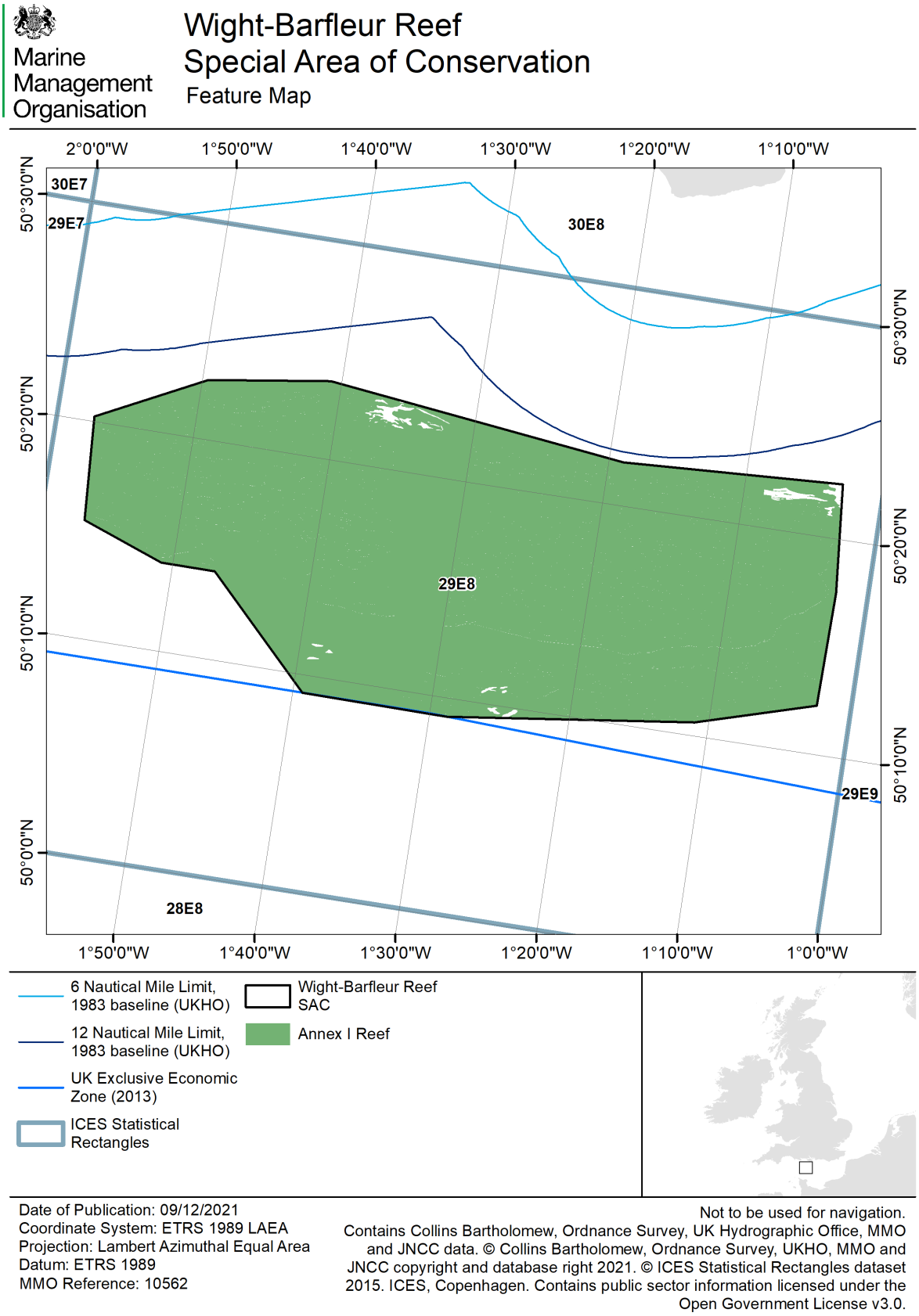

Figure 27: Wight-Barfleur Reef SAC location and designated feature distribution.

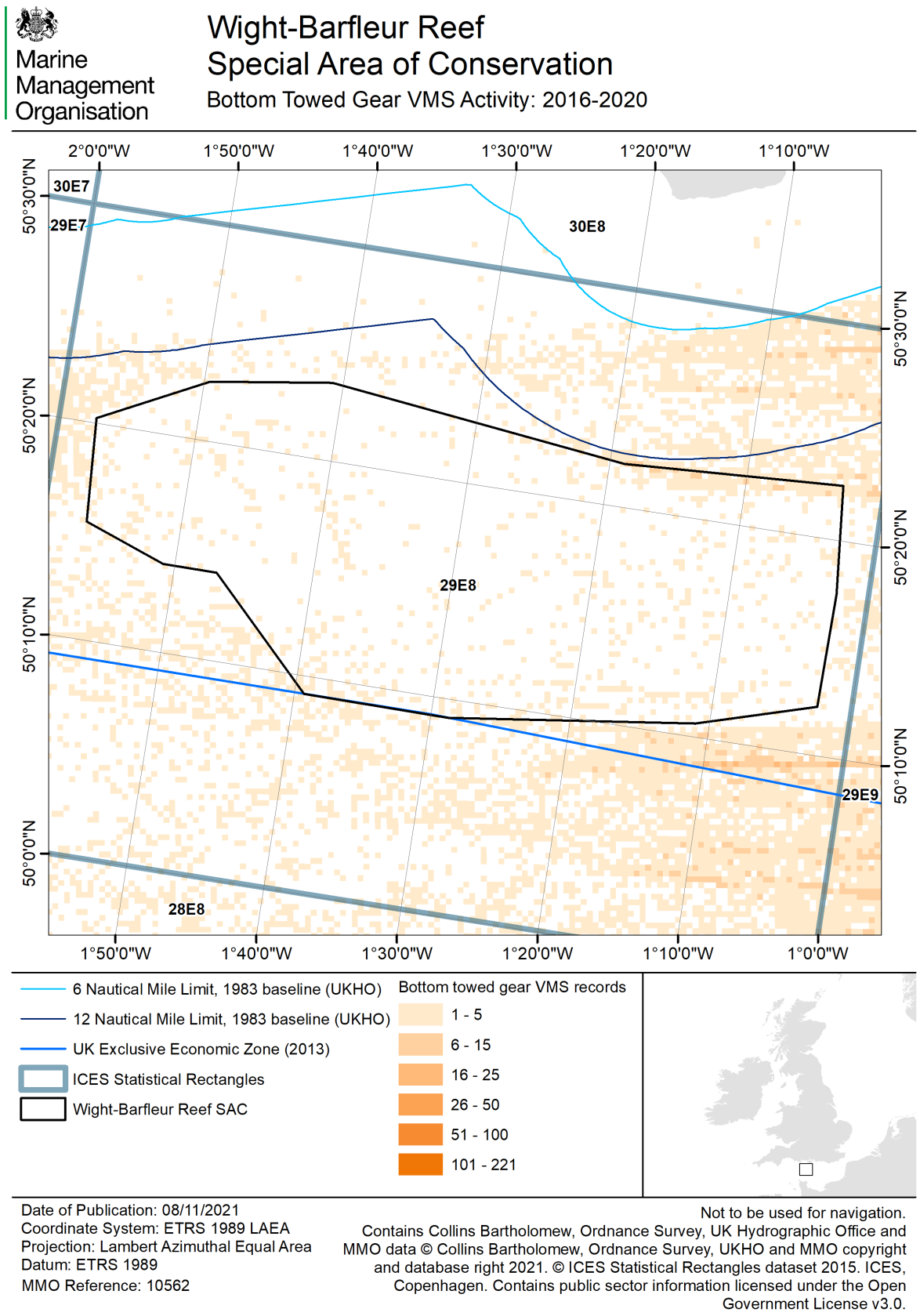

Figure 28: Wight-Barfleur Reef SAC VMS activity from bottom towed gear from 2016-2020.

3.13.3. Fishing activity

VMS records show that bottom towed gear activity within the site 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. Demersal trawling activity is concentrated primarily around the edges of the site, with a low level of activity in the centre of the site, whilst dredging activity occurs throughout the site, but mainly in the eastern section.

3.13.4. Fisheries impact assessment conclusion

As detailed in Figure 27, the vast majority of the Wight-Barfleur Reef SAC consists of Annex I reef: rocky. The VMS data (Figure 28) shows bottom towed gear activity is taking place over the protected reef feature and given the evidence detailed previously (section 2.3) regarding the impact of bottom towed gears on rock and reef features MMO conclude this interaction will result in an adverse effect on site integrity.

4. Conclusion

The evidence considered in section 2.3 of this assessment indicates that bottom towed fishing has the potential to have significant impacts on rock, reef and related features in the 13 MPAs considered. In particular these impacts are a result of physical impacts, such as abrasion.

Combined with consideration of the level of bottom towed fishing over the features assessed at each MPA (section 3), it is not possible to exclude significant negative impacts on the conservation objectives of those MPAs at this stage.

Proposed management measures to further the conservation objectives of these MPAs generally fall within four options:

- **Option 1.** No fisheries restrictions. Introduce a monitoring and control plan within the site.
- **Option 2.** No statutory restrictions. Introduce a voluntary agreement.
- **Option 3.** Reduction of pressures associated with bottom towed fishing gear(s) of concern, through zoned management (partial site prohibition of these gears over areas of sensitive features).
- **Option 4.** Removal of pressures associated with bottom towed fishing gear(s) of concern through a whole site prohibition of these gears.

Where MMO determines management measures will be required, MMO will identify the most appropriate way to implement these and take steps, including further formal consultation, accordingly. Please refer to the ’Stage 2 Draft MPA Fisheries Assessment: Background’ document for further information on our next steps and how you can contribute to the Call for Evidence.

5. Review of this assessment

MMO will review this assessment, or a selection of the above sites, every five years or earlier if significant new information is received. Such information could include:

- updated conservation advice;
- updated gear/feature impact evidence;
- updated advice on the condition of the features;
- considerable change in activity levels; or
- change in site management measures by another fisheries regulator.

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7. Glossary

Attribute - Selected characteristic of an interest feature/sub-feature which contributes to the overall condition of the feature to which it applies.

Bottom towed gear - a range of fishing gear types designed to take or disturb species living on or near the bottom of the seabed. Forms of bottom towed gear include trawls, dredges and seines. Fishing speed VMS records associated with the following gear codes have been included in VMS density maps: TBB – Beam Trawls, OT – Otter Trawls (not specified), OTB – Bottom Otter Trawls, OTT – Otter Twin Trawls, PT – Pair Trawls, PTB – Bottom Pair Trawls, TB – Bottom Trawls, TBN – Nephrops Trawls, TBS – Shrimp Trawls, TX – Other Trawls, DRB – Boat Dredges, HMD – Mechanized Dredge, HMP - Pumps, HMX – Harvesting Machines, SDN – Danish or Anchor Seines, SPR – Pair Seines, SSC – Scottish Seines, SV – Boat or Vessel Seines, SX – Seine Nets (not specified).

Conservation objectives - Conservation objectives are set for each designated feature of an MPA, to either maintain or restore a designated feature of the protected site.

Designated features – Habitats or species within an MPA which have been designated as protected features.

EMS – European marine site. Any special protection areas (SPAs) and special areas of conservation (SACs) that are covered by tidal waters.

Exposure - The level at which a designated feature or its supporting habitat is open to a distressing influence resulting from the possible/likely effects of operations arising from human activities (e.g. fishing) currently occurring on the site. The assessment of exposure can include the spatial extent, frequency, duration and intensity of the pressure(s) associated with the activities, where this information is available.

General management approach – The approach advised by an SNCB for a particular feature in order to help achieve the conservation objectives for an MCZ; either maintaining or recovering a feature to favourable condition.

Habitats Directive – Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora[37].

HOCI – habitat of conservation importance. Habitats that are threatened, rare, or declining. More information can be found in the Ecological Network Guidance (Marine Conservation Zone Project) section 4.2.34[38].

[37] https://www.legislation.gov.uk/eudr/1992/43/contents
[38] https://hub.jncc.gov.uk/assets/94f961af-0bfc-4787-92d7-0c3bcf0fd083

IFCA – Inshore Fisheries Conservation Authority. IFCAs are responsible for fisheries management from 0 to 6 nautical miles (nm). There are 10 IFCAs in England, each one funded by local authorities.

ICES – International Council for the Exploration of the Sea. ICES is an intergovernmental marine science organisation, providing evidence on the state and sustainable use of our seas and oceans.

JNCC – Joint Nature Conservation Committee. A public body that advises the government on UK and international nature conservation. This includes aspects related to the marine environment from 12 nm to 200 nm.

Marine plans – MMO marine plans have been designed to help manage the seas around England[39].

MCZ – marine conservation zone. Marine conservation zones are a type of MPA in English, Welsh and Northern Irish waters designated under the Marine and Coastal Access Act 2009[40] (for England and Wales) or The Marine Act (Northern Ireland) 2013[41] (for Northern Ireland).

MMO – Marine Management Organisation. MMO is an executive non-departmental public body, sponsored by the Department for Environment, Food and Rural Affairs and is the manager and independent regulator of England's seas.

MPA – marine protected area. Marine protected areas are protected sites with a marine element, this includes special areas of conservation (SAC), special protection areas (SPA) and marine conservation zones (MCZ).

MPA assessment – MPA site level assessments are carried out in a manner consistent with the requirements of in Regulation 63 of the Conservation of Habitats and Species Regulations 2017 and Regulation 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 for EMS and the requirements of Section 126 of the Marine and Coastal Access Act 2009 for MCZ. For EMS the assessments will determine whether, in light of the site's conservation objectives, fishing activities are having an adverse effect on the integrity of the site. For MCZ the assessments will determine whether there is a significant risk of fishing activities hindering the conservation objectives and general management approach of the site.

Natural England - Government advisor for the environment in England. This includes aspects of the marine environment of 0 to 12 nm.

SAC – special area of conservation. Special areas of conservation are MPAs put in place to protect habitats and species listed in Annexes I and II of Council Directive 92/43/EEC (the Habitats Directive).

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[39] https://www.gov.uk/government/collections/marine-planning-in-england
[40] https://www.legislation.gov.uk/ukpga/2009/23/contents
[41] https://www.legislation.gov.uk/nia/2013/10/contents

Sensitivity assessment – Assessment of sensitivity of a species or habitat which takes into account ability to resist impacts, and rate of rate of recovery after an impact.

SNCB - statutory nature conservation body. A collective term for Natural Resources Wales (NRW), Joint Nature Conservation Committee (JNCC), Natural England (NE), Northern Ireland's Council for Nature Conservation and the Countryside (which generally works through the Northern Ireland Environment Agency) and NatureScot. These organisations have a statutory responsibility to provide conservation advice for MPAs and report on the condition of protected features.

SPA – special protection area. Special protection areas are MPAs put into place to protect threatened bird species, designated under the Wild Birds Directive.

Supporting processes – used to describe the natural processes that support the feature. These include hydrodynamic regime, water and sediment quality and supporting habitats[42].

VMS – vessel monitoring system. All commercial fishing vessels over 12 metres in length in UK waters must report their position via VMS when at sea. VMS devices on the vessels send regular reports of position and vector.

[42] https://data.jncc.gov.uk/data/c965d0a4-917d-48bd-b2cb-6549fa24455d/JNCC-ConservationAdvice-GlossaryOfTerms-2018.pdf