Title:	Impact Assessment (IA)
Land's End and Cape Bank European Marine Site (specified areas) bottom towed gear byelaw impact assessment **IA No:** MMO02 **Lead department or agency:** Marine Management Organisation **Other departments or agencies:** Defra, Natural England, Cornwall Inshore Fisheries and Conservation Authority	**Date:** 11/12/2013 **Stage:** Development/Options **Source of intervention:** Domestic **Type of measure:** Secondary Legislation **Contact for enquiries:** Michael Coyle Michael.Coyle@marinemangement.org.uk 0300 123 1032
Summary: Intervention and Options	**RPC Opinion:** RPC Opinion Status

Cost of Preferred (or more likely) Option				
Total Net Present Value	**Business Net Present Value**	**Net cost to business per year** (EANCB on 2009 prices)	**In scope of One-In, Two-Out?**	**Measure qualifies as**
NA	NA	NA	No	NA

What is the problem under consideration? Why is government intervention necessary?

The Marine Management Organisation is proposing this byelaw because there is a need to protect designated Annex I bedrock reef features within this European marine site (EMS) from fishing using bottom towed gear.

This byelaw is proposed in accordance with the revised approach introduced by the Department for Environment, Food and Rural Affairs (Defra) to ensure the full compliance with Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the Birds Directive) with respect to commercial fishing activity.

Intervention is required to redress market failure in the marine environment by implementing appropriate management measures (e.g. this byelaw) to conserve features to ensure negative externalities are reduced or suitably mitigated. Implementing this byelaw will ensure continued provision of public goods in the marine environment.

The revised approach to commercial fishery management is being implemented using an evidence based, risk-prioritised, and phased basis. The approach is informed by an agreed matrix showing how fishing activities could affect features designated in EMSs. Each activity/feature interaction has been categorised as red, amber, green or blue according to the potential risks that specific gear types present to the interest features. A red category indicates that there is a high risk to the feature, and that management actions should be prioritised and implemented by the end of 2013. All remaining gear type/feature interactions identified within the matrix will be assessed, and appropriate management measures implemented, if required by 2016.

The interaction between bottom towed gear and the bedrock reef feature in the Land's End and Cape Bank Site of Community Importance (SCI) has been identified as red, and therefore a priority for management to remove the risk of damage to the feature from bottom towed gear. There are no other features within the site. The proposed byelaw will ensure that the fishing activity/feature interaction is managed in accordance with Article 6 of the Habitats Directive. The interactions between other fishing gears and reef features have been identified as a lower priority and so will be considered at a later date.

For sites located between 0 and 6 nautical miles (nm), Defra expects the relevant Inshore Fisheries and Conservation Authority (IFCA) to be the lead regulatory authority. For sites between 6 and12nm, the MMO is the lead regulatory authority and measures will be introduced on a non-discriminatory basis in accordance with, Article 9 of Council Regulation 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy.

Following discussions between the MMO and Cornwall IFCA, it has been agreed that, a MMO byelaw for the part of the Cape Bank reef feature within the 0 and 12nm is the preferred option.

What are the policy objectives and the intended effects?

- To prevent the deterioration of bedrock reef features within the section of the Land's End and Cape Bank SCI, between 6 and 12nm, from impacts associated with deployment of bottom towed fishing gears;
- To further the conservation objectives stated for the Land's End and Cape Bank SCI;
- To ensure compliance with the Habitats Directive in line with Defra's revised approach;
- To promote sustainable fisheries while conserving the marine environment;
- To minimise the impact on bottom towed gear fishing activity, by maintaining access, where possible, to fishing grounds within the SCI;
- To reduce external negativities and ensure continued provision of public goods.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

1. Do nothing.
2. Voluntary measures.
3. MMO byelaw prohibiting bottom towed gears throughout the SCI ('full site closure').
4. MMO byelaw to prohibit bottom towed gears over bedrock reef feature with appropriate buffering ('zoned management').
5. Management of activity through a Statutory Instrument, Regulating Order or fishing licence condition.

The preferred option is Option 4 which will promote sustainable fisheries, conserve the marine environment and ensure compliance with the Habitats Directive.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** Not applicable					
Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	**Micro** Yes/No	**< 20** Yes/No	**Small** Yes/No	**Medium** Yes/No	**Large** Yes/No
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)			**Traded:**	**Non-traded:**	

I have read the impact assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible SELECT SIGNATORY: _____ Date: _____

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2013	**PV Base Year** 2013	**Time Period Years** 10	**Net Benefit (Present Value (PV)) (£m)**		
			Low: Optional	**High:** Optional	**Best Estimate:**

COSTS (£m)	**Total Transition** (Constant Price) Years		**Average Annual** (excluding transition) (Constant Price)	**Total Cost** (Present Value)
Low	NO		Optional	**Optional**
High	NO		Optional	**Optional**
Best Estimate	NO		**Optional**	**£0.20m**

Description and scale of key monetised costs by 'main affected groups'

Estimated annual enforcement costs to be faced by MMO range between **£22,475** to **£23,475.** The best estimate of enforcement costs is assumed to be the mid-point of the low and high cost scenarios **(£22,975)**, which results in a present value of costs over 10 years of **£0.2m**. One-off costs are not anticipated.

Estimated annual loss of UK landings within the prohibited area including buffer zone is **£11,788** and the value of GVA affected is **£4,126.09**.[1] Present value of GVA over the 10 year IA timeframe is **£0.04m.**

Due to minimal displacement caused by the intervention, as alternative grounds are accessible, total cost estimates do not include loss of GVA. Costs to fisheries in that case are likely to be an overestimation as no displacement has been assumed and 100% of GVA in the areas affected is assumed lost.

Other key non-monetised costs by 'main affected groups'

French and Belgian vessels have legal access rights in the section of the SCI outside 6 nautical miles.

Section 7.4 highlights the limited activity for both Belgian and French vessels within this SCI which was also confirmed by our early engagement with Belgian fishing industry representatives. Engagement with French authorities occurred in September. During formal consultation both the French and Belgian fishing industry representatives confirmed that some fishing activity takes place in the proposed Cape Bank prohibited area.

The MMO proposes to use other enforcement bodies such as UK Border Agency and the police in order to fully utilise their resources for surveillance and enforcement. These costs cannot be monetised at present as they are requested on an ad hoc basis and costs can vary. These additional costs can be added if required at a later date.

[1] Further details on the approach is available in Annex H7 for the MCZ IA http://publications.naturalengland.org.uk/publication/1940011

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excluding transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	**Optional**
High	Optional	Optional	**Optional**
Best Estimate			

Description and scale of key monetised benefits by 'main affected groups'

No monetised figures are available for the benefits of the recommended closure. However, significant potential benefits are described below.

Other key non-monetised benefits by 'main affected groups'

The environmental benefits from the introduction of this byelaw will be significant as it will protect the bedrock reef features within the site from bottom towed gear. This will contribute to meeting the 'maintain' conservation objective. This will have an overall benefit to the reef habitat, as a result of the prohibition recommended. This may promote more recreational use in the area such as divers and recreational anglers, which could potentially benefit the local economy (see evidence base).

Key assumptions/sensitivities/risks **Discount rate (%)** 3.5%

Average cost estimates for the fishing industry are based on MMO landings values estimated within the SCI and International Council for the Exploration of the Sea (ICES) division VIIe statistical rectangle 29E4. It is unknown what proportion of the total landings value was actually derived directly from the proposed prohibited area, which makes up less than 5.79% of an ICES statistical rectangle (3,840 square km). The statistics data presented in this IA was produced using reported activity within the ICES rectangles that cover the defined SCI areas. The reported activity of UK vessels (quantity and value of landings along with details of gear involved) is taken from the MMO Ifish database and includes all logbook entries for UK registered fishing vessels. Information on Belgian and French vessels has been informed by extracts of landings data reported by Member States to the Scientific, Technical and Economic Committee for Fisheries (STECF) working group on fishing effort regimes. Further description of the methodologies used to produce fishery costings is detailed in Annex A and B.

Reported GVA for UK vessels was calculated by multiplying the value of landings by **percentage** of total income that constitutes GVA for the relevant gear type/region. The provided estimate of GVA as a percentage of total income (35% for bottom trawls) was also used in the calculations for proposed MCZs.

Information gathered from fishers and other stakeholders during the pre-consultation meetings is used to support the evidence base and assumptions with the caveat that it is anecdotal evidence only. The information gathered was opportunistic and is only a snapshot from the respondents available to provide comments on the day. The number of respondents reflects only those who independently came forward with the information rather than the number who necessarily agree or disagree with the statement.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			In scope of OITO?	Measure qualifies as
Costs:	**Benefits:**	**Net:**	Yes/No	IN/OUT/Zero net co

Evidence base

1. Introduction

1.1 Site: Land's End and Cape Bank SCI[1].

1.2 Land's End and Cape Bank SCI has been designated on account of the bedrock reef communities within the site. Bedrock reef communities are areas of protruding rock, colonised by a suite of flora and fauna. A transition of communities can occur from the near surface sunlit zone, dominated by plants, such as kelp forests and red seaweeds, to the deeper waters where a variety of fauna inhabit the bedrock reefs, including echinoderms, sponges, corals, anemones, bryozoans and crustaceans[2].

1.3 The bedrock reefs within this site are some of the most biologically diverse in the country and play an important role in supporting species that are considered rare or are occurring at the limit of their bio geographical distribution.

1.4 The Department for Food, Environment, and Rural Affairs (Defra) has introduced a revised approach to the management of fisheries in EMS (see section 2.1) This has resulted in the need for the MMO to establish measures to protect the bedrock reef feature from bottom towed fishing gears in the Cape Bank section of the SCI between the 0 to 12nm limits to ensure full compliance with Article 6 of the Habitats Directive[3].

1.5 Bottom towed gear means any fishing gear which is pushed or pulled through the sea and contacts the seabed. This includes demersal otter and beam trawls and shellfish dredges. Management measures restricting these activity/feature interactions are therefore required.

1.6 This IA has been prepared to outline the costs and benefits of the proposed MMO byelaw to prohibit bottom towed gears for the protection of these features. The IA also indicates why the option being recommended is the preferred option for management. A draft of this IA has been subject to public consultation.

1.7 Data and evidence to inform this IA has been gathered from Natural England (NE), IFCAs, and the MMO. In addition, the MMO, in conjunction with Cornwall IFCA, hosted a drop-in session in Looe on the 10/6/2013 and in conjunction with Devon and Severn IFCA, in Plymouth, on 11/6/2013 to meet stakeholders to ask direct questions and gather evidence as to the economic impacts of the proposed prohibited areas. A meeting with the Belgian authorities and fishing industry representatives was held in Belgium on 12/07/2013 and with the French authorities and fishing industry representatives in Paris on 27/9/2013. The French fishing industry representatives highlighted the use of French otter trawls in the Cape Bank proposed prohibited area and highlighted the need for technological advances in gear types to be factored into the management. Information and statements from interviews with commercial fishermen were recorded and incorporated into this IA as anecdotal evidence.

1.8 As part of the statutory byelaw process, drafts of the proposed byelaw and IA for this site were formally consulted on from 10/9/2013 to 22/10/2013. Comments from French fishing industry

[1] Sites of Community importance (SCIs) are sites that have been adopted by the European Commission but not yet formally designated as SACs by the UK Government.
[2] Natural England Formal advice: www.naturalengland.org.uk/ourwork/marine/mpa/ems/submitted.
[3] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

representatives have confirmed that bottom towed fishing activity takes place Western side of the proposed Cape Bank prohibited area. The Belgian fishing industry representatives' response also confirmed Belgian fishery activity in the Northern area of the Cape Bank proposed prohibited area.

2. Rationale for intervention

2.1 In August 2012 Defra undertook a review into the management of fisheries within EMS in order to identify future management required to ensure site features are maintained at favourable condition. This resulted in a revised approach[4] to management of fishing in EMS.

2.2 The revised approach is being implemented using an evidence based, risk-prioritised, and phased basis. Risk prioritisation is informed by a matrix[5] which categorises the risks from interactions between fishing activity and ecological features. Activity/feature interactions have been categorised as red, amber, green or blue. Those classified as red have been prioritised for the implementation of management measures by the end of 2013 (regardless of the actual level of activity) to avoid the deterioration of designated features in line with obligations under Article 6(2) of the Habitats Directive. Interactions which are categorised as amber require a site-level assessment to determine whether management of an activity is required to protect features. Interactions which are categorised as green also require site-level assessment if there are "in-combination" effects. A categorisation of blue indicates that there is no feasible interaction, and as such no further assessment is required[6].

2.3 Paragraphs 6(1) and 6(2) of the Habitats Directive[7] require that, within special areas of conservation (SACs) and special protection areas (SPAs), member states shall:

- establish the necessary conservation measures which correspond to the ecological requirements of the Annex I natural habitat types and the Annex II species present on the sites
- take appropriate steps to avoid the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated

2.4 Regulation 8(1) of the Conservation of Habitats and Species Regulations 2010 defines an EMS as any (among others) SAC, SPA and SCI. Part 6 of these regulations lay out the management requirements for EMS, in line with Articles 6(2), 6(3) and 6(4) of the Habitats Directive.

2.5 Land's End and Cape Bank SCI contains bedrock reef features which have been categorised as red risk with regard to bottom towed gears and therefore management measures are required to remove this risk. The MMO is responsible for implementing management to prohibit the interaction between the bedrock reef features and bottom towed fishing gear. The interaction of

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[4] Fisheries in EMS policy document: www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/policy_and_delivery.pdf

[5] Matrix: www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/populated_matrix3.xls

[6] Centre for Environment, Fisheries and Aquaculture Science (CEFAS) review of matrix and supporting evidence: http://www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/cefas_matrix_review.pdf

[7] http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

other fishing gear types with the bedrock reef features will be assessed during the amber/green assessment process.

2.6 This site lies across two administrative areas: 0 to 6nm and 6 to12nm. There are two main areas of bedrock reef feature within the site, one in the Land's End portion and one in the Cape Bank portion. The Land's End reef lies within 6nm and will be managed through a Cornwall IFCA byelaw. The Cape Bank reef lies both inside 6nm and within the 6 to 12nm area and will be managed through an MMO byelaw.

2.7 The specific location and extent of the bedrock reef feature was provided by NE[8]. The buffer is based on NE draft guidance[9], which recommends the size of the buffer based on the depth of the feature being protected. The bedrock reef features in this site extend to up to 100m depth. For depths between 25 and 200m, the NE guidance recommends a buffer of three times the depth of the feature. A buffer of 300m was therefore applied (three times 100m).

2.8 Intervention is required to redress market failure in the marine environment by implementing appropriate management measures (e.g. this byelaw) to conserve features to ensure negative externalities are reduced or suitably mitigated. Implementing this byelaw will ensure continued provision of public goods in the marine environment.

2.9 Market failures occur when market does not deliver an efficient outcome.[10] In the context of the marine environment these failures can be described as:

- For public goods and services – A number of goods and services provided by the marine environment such as climate regulation and biological diversity are 'public goods' (no-one can be excluded from benefiting from them and consumption of the service does not diminish the service being available to others). The characteristics of public goods mean that individuals do not necessarily have an economic incentive to voluntarily contribute effort or money to ensure the continued existence of these goods leading to undersupply or in this case under-protection.
- Negative externalities – Negative externalities occur when damage to the marine environment is not fully borne by the users causing the damage. In many cases no monetary price is attached to marine goods and services therefore the cost of damage is not directly priced by the market. Even for those goods that are traded (such as wild fish), market prices often do not reflect the full economic cost, which is ultimately by other individuals and society as a whole.

2.10 Government intervention is required to redress both these sources of market failure in the marine environment. Management measures to conserve designated features of EMS will ensure negative externalities are reduced or suitably mitigated. Management measures will also support continued provision of public goods in the marine environment, for example conserving the range of biodiversity in England's seas.

[8] NE formal advice letter, 2013
[9] NE buffer advice (draft), April 2013. Contact NE for more information.
[10] HMT Green Book (2003)
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220541/green_book_complete.pdf

3. Policy objectives and intended effects

3.1 The Marine and Coastal Access Act 2009[11] (MaCAA) established MMO to lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry.

3.2 The policy objective pertinent to this IA is to further the conservation objectives of this site by ensuring that the bedrock reef feature is protected from the risk of damage from bottom towed gears.

3.3 The conservation objectives of this site are:

- Subject to natural change, to maintain:
    - The extent of the bedrock reef habitat and the diversity of the habitat and it's component species
    - The community structure of the habitat (e.g. population structure of individual notable species and their contribution to the functioning of the ecosystem)
    - The natural environmental quality (e.g. water quality, suspended sediment levels, etc)
    - The natural environmental processes (e.g. biological and physical processes that occur naturally in the environment, such as water circulation and sediment deposition, which should not deviate from baseline at time of designation)[2]

3.4 The intended effects are that the risk of deterioration of the bedrock reef feature will be reduced and obligations under Article 6 of the Habitats Directive will be met. In addition, the economic impacts of management intervention will be minimised where possible.

4. The options

4.1 As part of Defra's revised approach, the preferred management tools are MMO byelaws within 6 to 12nm, and for MMO to lead the management of sites that straddle the 6nm boundary. Following discussions between MMO and Cornwall IFCA, it has been agreed that, although this SCI straddles the 6nm boundary, IFCA byelaws will be established to manage Land's End part of the site within 6nm and an MMO byelaw will be manage the Cape Bank part of the site between 0 and 12nm. Therefore an MMO byelaw for the Cape Bank part of the SCI between 0 and 12nm is the recommended option.

4.1.2 Option 1: **Do nothing**

This option would not involve introducing any permanent management measure. This option would mean that risks to the site from damaging activities would not be addressed and that obligations under Defra's revised approach and Article 6 (2) of the Habitats Directive would not be met.

4.1.3 Option 2: Voluntary agreement

This option would involve the development of voluntary codes of practice to protect features. MMO has considered this option in light of Better Regulation Principles, which require that new regulation is introduced only as a last resort, and Defra's revised approach, under which there is an expectation that management measures will need to be regulatory in nature to ensure adequate protection is achieved. Defra's revised approach also requires measures to be implemented to address high risk (red) interactions between designated features and fishing gears

[11] www.legislation.gov.uk/ukpga/2009/23/contents/enacted

by the end of December 2013. MMO considers that due to the need to protect features quickly, and the risk that even low levels of interaction could lead to deterioration of the feature, voluntary measures are not appropriate in this case.

4.1.4 Option 3: MMO byelaw prohibiting bottom towed gear throughout the SCI ('full site closure')
Prohibiting bottom towed gear throughout the whole Cape Bank part of the SCI is not necessary to achieve protection of the bedrock reef feature and would result in unnecessary economic loss for fishermen using other parts of the SCI.

4.1.5 Option 4: MMO byelaw to prohibit bottom towed gears over *Sabellaria spinulosa* reef features with appropriate buffering ('zoned management')
This is the preferred option and a full analysis of this option is included below

4.1.6 Management of activity through a statutory instrument, regulating order or fishing licence condition
These mechanisms for management are deemed to be not appropriate in this instance. MMO byelaw making powers as designated under the MaCAA are more appropriate because they are designed to be used to manage activity within marine protected areas providing the appropriate level of power, flexibility, consultation and speed.

4.2 Recommended Option:

4.2.1 MMO byelaw to prohibit bottom towed gears over the bedrock reef feature with appropriate buffering ('zoned management').

4.2.2 This option is recommended because it is the most cost effective option. MMO is the most appropriate authority to take forward fisheries management measures for the Cape Bank reef feature between 0 and12nm as it has powers to make byelaws throughout this area to further the conservation objectives of the SCI. The boundary of the proposed prohibited area was determined taking into account the best available existing evidence of the extent of the features as well as the need for a 'buffer zone' between the features and the byelaw boundary. Ease of enforcement and the need to have clear demarcation to promote compliance was also taken into account when considering the shape of the prohibited area.

5. Evidence base

5.1 Impacts of bottom towed gear activity on bedrock reef:

5.1.1 The available evidence[12] consisting of empirical studies quantifying the impact of fisheries to hard bottom habitats is limited. However, it is known that towing trawls across rocky substrates will cause damage or death to a significant proportion of large, upright attached species such as sponges and corals (Løkkeborg 2005). 67% of sponges were damaged during to a single trawl pass, in the Gulf of Alaska (Freese et al 1999). Other species such as hydroids, anenomes, bryozoans, tunicates and echinoderms are vulnerable to mobile fishing gear (McConnaughey et al 2000, Sewell and Hiscock 2005). Trawling may also reduce habitat complexity as boulders and cobbles associated with the hard substrate are moved around (Engel and Kvitek 2008, Freese et al 1999). Resistance to damage at a physical level is variable with substrate type, with mudstone

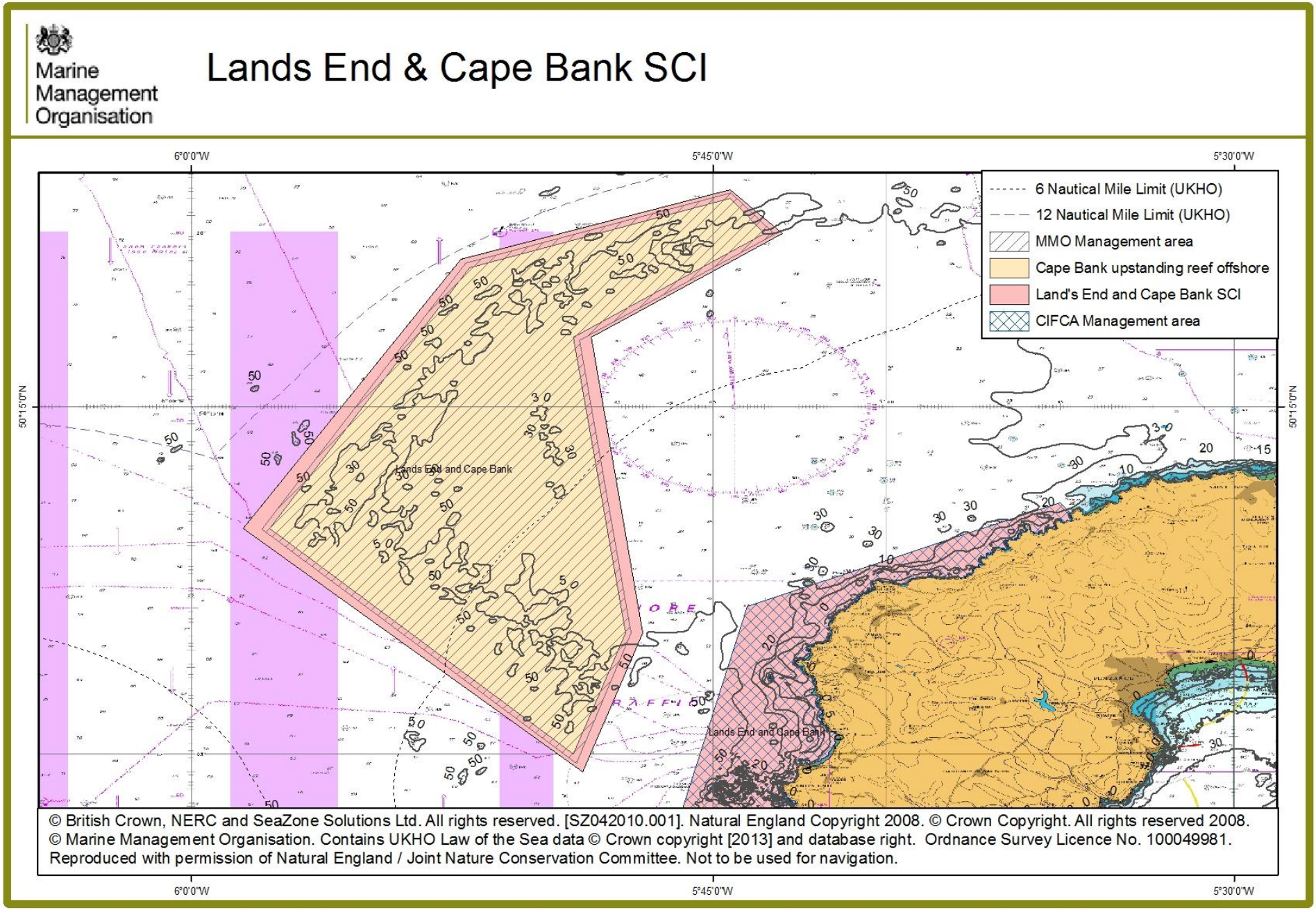
[12] Subtidal bedrock reef audit: www.marinemanagement.org.uk/protecting/conservation/documents/ems_fisheries/subtidalbedrock.pdf

reefs particularly vulnerable to structural damage (Attrill et al 2011). It is considered that the risk of significant impact is sufficient to require a categorisation of red risk and therefore management measures implemented this year.

5.2 Bedrock reef feature distribution

Figure 1 below identifies the location of the reef bedrock feature within the Cape Bank part of the SCI.

Figure 1: Site and feature map



6. Sectors affected

6.1 Fishing industry: The main vessels affected from the prohibition will be beam trawlers, dredgers and other demersal trawls which primarily include vessels landing into Newlyn. French and Belgian vessels have access rights to fish for demersal species however, the majority of this catch is not landed in the UK. Dialogue with stakeholders and the Belgian fishing industry representatives during the pre-consultation for this proposed management measure indicated that bottom towed fishing activity is limited. A number of French otter trawlers fish in the Western end of the Cape Bank proposed prohibited area and several Belgian vessels in the Northern end of the same area. It is not expected that the intervention will have an impact on non fisheries sectors.

6.2 Local economies and society: The potential for social and economic costs to the UK, French and Belgian local communities as a result of potential landings lost, and resulting impact on the local fishery is low. This is due to alternative fishing grounds being accessible and therefore displacement will be minimal. There are likely low impacts from the preferred option as the predominant fisheries are for static gear by vessels based in Newlyn, Mousehole, Sennen Cove, other Penwith Coves, St Ives and Hayle. The wider benefits of protecting the bedrock reefs are outlined in section 7.

6.3 Enforcement bodies: The lead responsibility of enforcing the proposed prohibited area in the 0 to 12nm limit will fall to MMO and therefore the additional enforcement cost would impact on MMO. These estimated costs are outlined in section 7.

7. Analysis of costs and benefits

7.1 Costs for recommended option

7.1.1 The prohibition of bottom towed gear in the proposed area could result in the following costs:

- Direct cost to the fishing industry from reduced fishing grounds.
- Costs to the fishing industry associated with displacement to other fishing grounds.
- Potential environmental impacts related to possible increased damage to habitats on other areas due to displacement.
- Costs to the MMO for the administrative and enforcement of management.

7.1.2 Costs to the fishing industry, including potential displacement costs, and administrative and enforcement costs to MMO can be monetised and these estimated values have been collated and presented as part of this IA. Environmental costs due to possible increased damage of habitats are difficult to value and are therefore described here as non-monetised costs.

7.2 Analysis of fisheries costs

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

- Landings data for vessels from 2008 to 2011 taken from entered log book and sales note data provided by MMO statistics.
- Landings data to ICES rectangle level. Further analysis to estimate catch and estimated landings for the SCI and reef/buffer area for UK and other member states.
- Information gathered from fishers during pre-consultation engagement, June-August 2013, by MMO.
- Information gathered from stakeholders during MMO formal byelaw consultation, 10 September to 22 October 2013.

- Local MMO and IFCA coastal officer's knowledge.

7.3 Uncertainty and data assumptions

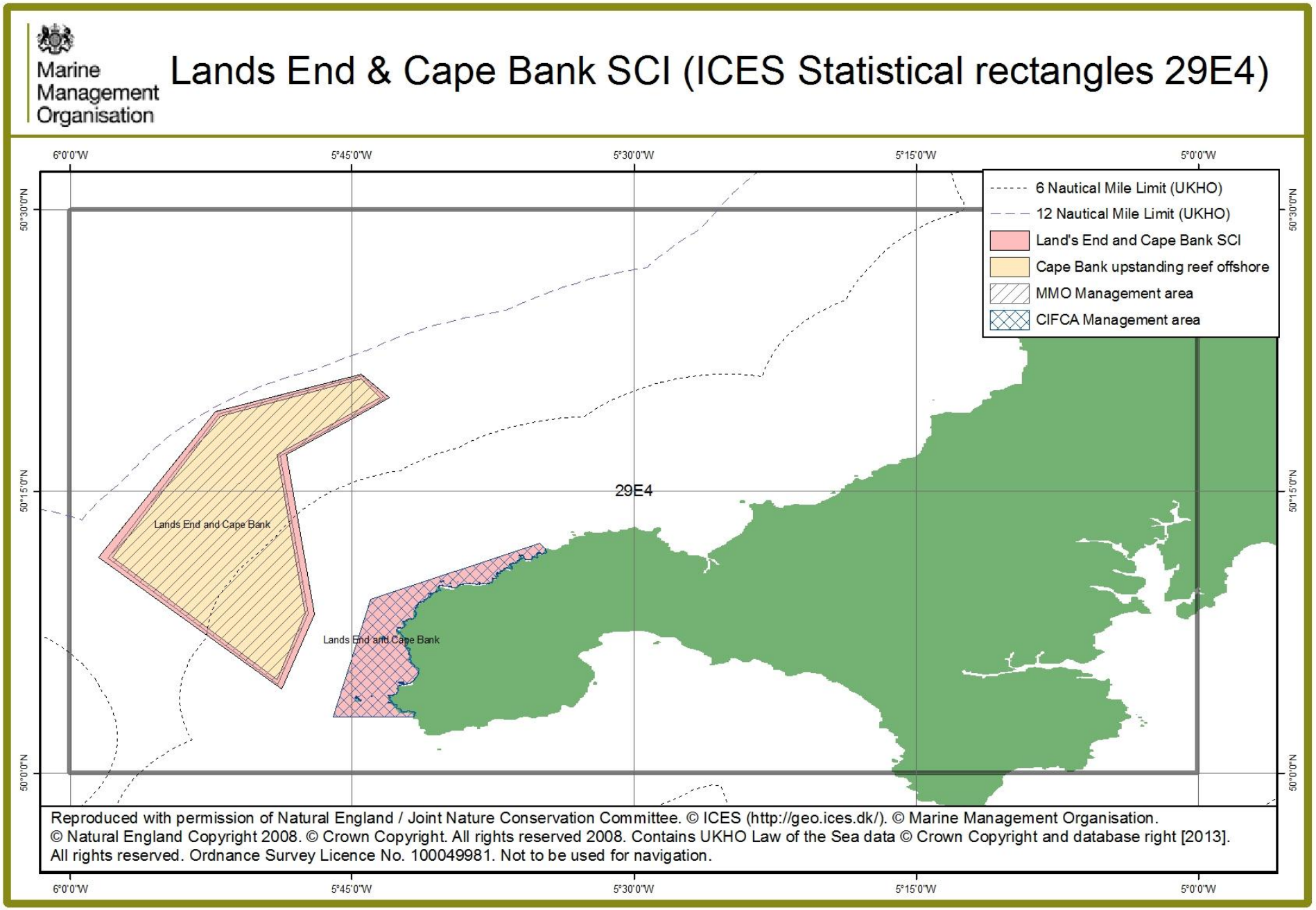
7.3.1 Average cost estimates have been based on landings values estimated within the SCI within ICES statistical rectangles 29E4 (See Figure 2). It is unknown what proportion of the total landings value was actually derived directly from the proposed prohibited area which makes up less than 5.79% of an ICES rectangle. The statistical data was produced using reported activity within the ICES rectangles that cover the defined SCI areas. The reported activity (quantity and value of landings along with details of gear involved) is taken from MMO Ifish database. Information on Belgian and French vessels has been informed by extracts of landings data reported by Member States to the Scientific, Technical and Economic Committee for Fisheries (STECF) working group on fishing effort regimes. Further description of the methodologies used to produce fishery costings is detailed in Annex A and B.

7.3.2 The proposed prohibited area values detailed in Table 1 have been derived by taking the values estimated within the SCI and applying a percentage based on the square area prohibited within the SCI itself. In most cases the square area of the proposed prohibited areas are relatively small compared to the SCI as a whole. Therefore, the estimation detailed should be used with caution will not indicate the true value attributed within the proposed prohibited area. It is also acknowledged that possible increased biodiversity around the reef means that it could be a relatively more abundant fishing ground, and the analysis may underestimate value of reduced fishing ground.

7.3.3 Information gathered from fishers and other stakeholders during the pre-consultation meetings is used to support the evidence base and assumptions with the caveat that it is anecdotal evidence only. The information gathered was opportunistic and is only a snapshot from the respondents available to provide comments on the day. The number of respondents reflects only those who independently came forward with the information rather than the number who necessarily agree or disagree with a statement.

7.3.4 Other member state landings data is limited as the majority of these vessels do not land in the UK. However, some assumptions can be made from the over 15m other member state fleet through VMS received into the UK FMC, detailed in 7.4

Figure 2: Map showing the ICES statistical rectangle 29E4 and the Land's End and Cape Bank SCI



7.4 Fishing activities within Land's End and Cape Bank SCI

7.4.1 The majority of the UK vessels which operated within ICES area 29E4 are under 10 metres in length and are predominantly netters (165 vessels), handliners (146 vessels), potters (71 vessels) and other demersal trawls (11 vessels). There are occasional over 15 metre beam trawlers (25 vessels).

7.4.2 The main species landed are pelagic fish, crustaceans, demersal fish and molluscs.

7.4.3 French and Belgian vessels have legal access rights in the section of the SCI outside 6nm.

7.4.4 The majority of French and Belgian vessels which operate within the ICES areas are over 15m with the occasional under-10 metre vessel. Data for other member state landings is limited as the majority of these vessels do not land in the UK. VMS data[14] from the French and Belgian fleet show little or no activity within the proposed prohibited areas of the SCI to which they have access to (Figures 3 and 4).

7.4.5 A pre-consultation meeting was held with the Belgian fishing industry on the 12/7/2013 in Ostend, with the assistance of the Belgian fisheries authorities. This was to inform them of the potential management of commercial fisheries in England's SCI in relation to Belgian fishing access rights in 6 to 12nm. Representatives from the industry who attended the meeting on the 12 July indicated that the current proposed measures to protect bedrock reef feature in the SCI did not significantly affect their activity. These bedrock reef features were seen to be mostly inhospitable to bottom towed gear. A consultation meeting was held with the French authorities and fishing industry representatives in Paris on 27/9/2013 which confirmed that there were twelve 15 – 24 metre otter trawl vessels from Normandy fishing in the proposed Cape Bank prohibited area.

7.4.6 Formal consultation responses from both the Belgian and French fishing industry representatives confirmed that some fishing activity occurs within the proposed prohibited area.

[14] Data is also held for 2010 and 2011 which also indicates limited activity

Figure 3: 2012 French VMS positional reports in ICES rectangle 29E4

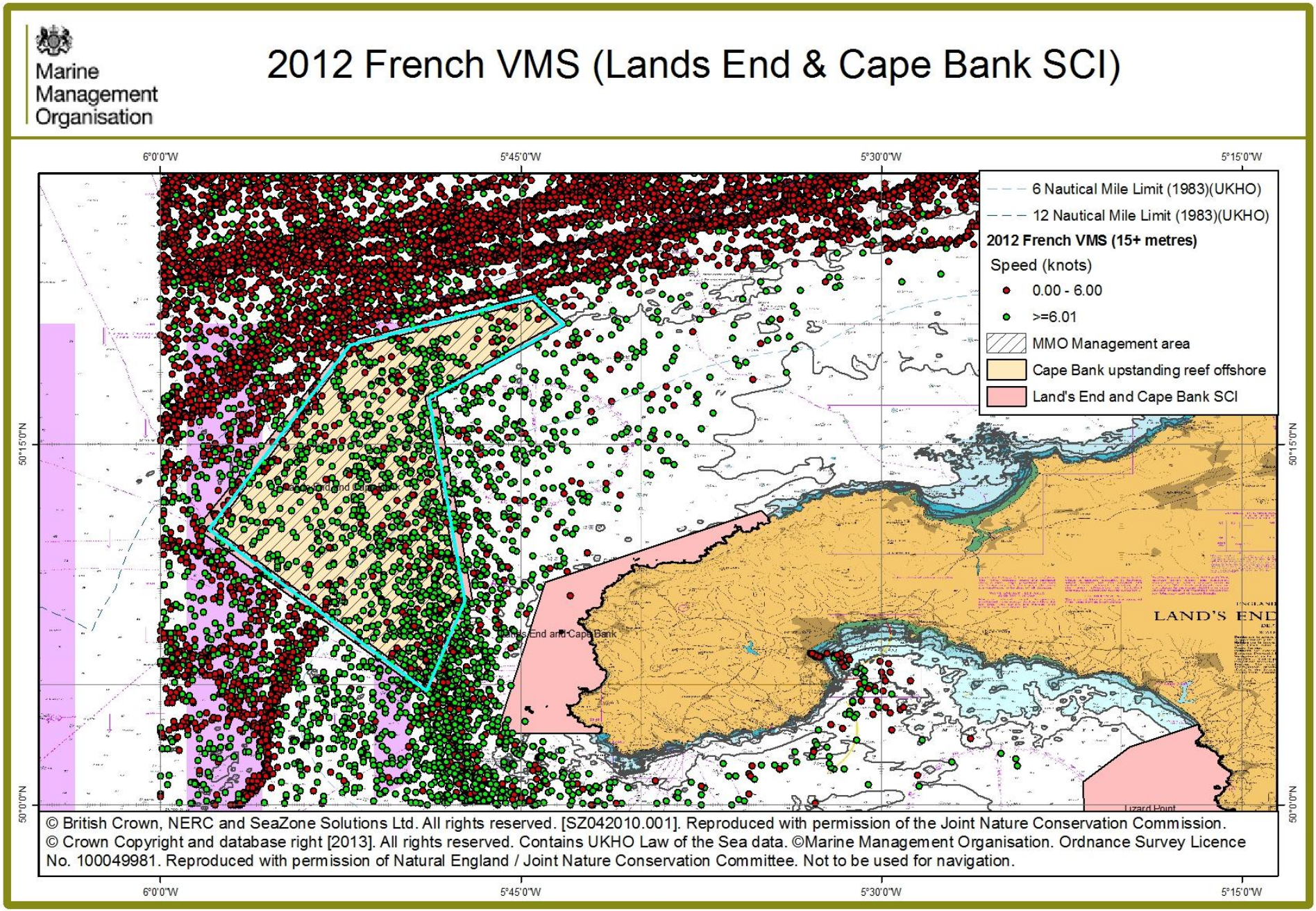
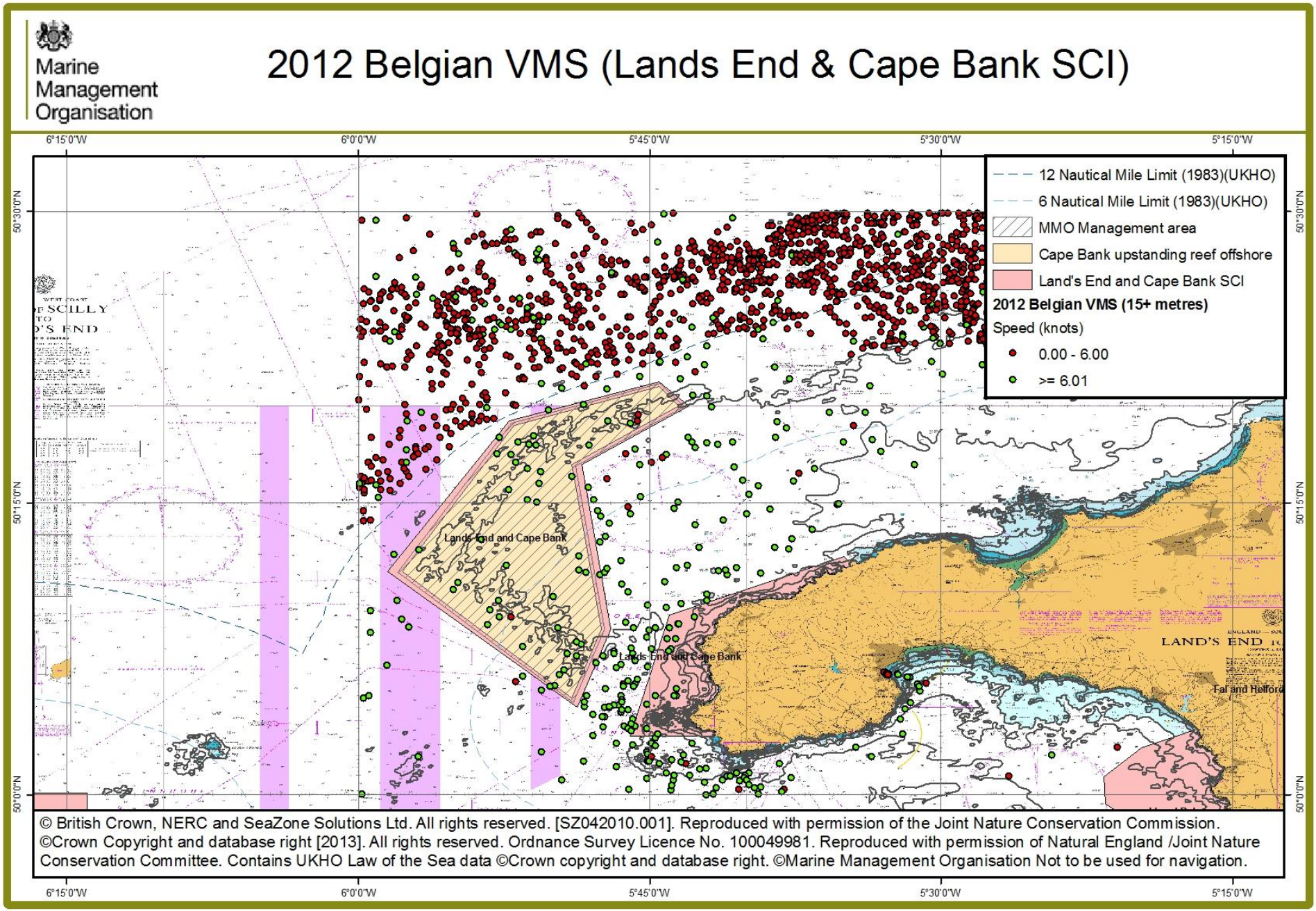


Figure 4: 2012 Belgian VMS positional reports in ICES rectangle 29E4



7.5 Valuation of affected landings

UK

7.5.1 The direct impact on fishing vessels would be a reduction in catch and therefore landings from bottom towed gear in the proposed prohibited area. In order to estimate potential impacts, landings data collated by the MMO was analysed.

7.5.2 Calculation of affected landings from ICES statistical rectangle area 29E4 (for the UK vessels identified as fishing in the area since January 2008) is shown in Table 1. Estimates in Table 1 are based on average landings from January 2008 to December 2011.

Table 1: UK landings from ICES area 29E4 as an average per year and estimated average landings within the SCI (January 2008 – December 2011)

Gear Type	Landed weight (tonnes)	Value with ICES 29E4 (£)	Value within SCI (£)	Value within prohibited area (73.813% of the SCI) (£)
Beam trawlers	209	£830,886	£2492.30	£1,839.65
Dredgers	86	£120,294	£0	£0
Nephrop trawls	3	£3,753	£141.90	£104.74
Other demersal trawlers	161	£342,297	£13,337	£9,844.44
Total	**459**	**£1,297,230**	**£15,971.20**	**£11,788.83**

7.5.3 Estimated values of landings within the SCI have been calculated by associating available landings data (provided by each fishing vessel at ICES rectangle level) with fishing vessel activity data (based on VMS reports) within the SCI. This approach applies a proportion of the landings for each ICES rectangle to the SCI, based on the level of activity within the SCI.

For the Land's End and Cape Bank SCI, landings data for the ICES rectangle (29E4) were used, and were categorised by size of vessel (over 15 metre vessels, 10 to 15 metre vessels and under 10 metre vessels).

Landings values from within the proposed prohibited area were then estimated as a proportion, (based on the size of the respective areas) of the estimated value from within the SCI.

It is estimated that the average annual income for the over 15 metre beam trawling fleets from the SCI is £2,434.6. Over 15 metre dredgers are shown as nil and equally other demersal trawlers are shown as nil. For the under 10 m beam trawling fleet the estimated average annual income is £10.90. The estimated average annual income from 10 to 15 metre beam trawling fleet is £46.80.

From our pre-consultation engagement with stakeholders the main monetary impact from the introduction of this byelaw will be on bottom trawling and scallop dredging.

7.5.4 It has been estimated that within the proposed prohibited area (which is **73.813%** of the SCI) the total loss in landings would be **£11,788.83.** Please refer to Annex A for further description on methodology.

7.5.5 The estimated total cost is likely to be an overestimation as no displacement has been assumed.

France and Belgium

7.5.6 From the analysis of VMS data the vast majority of Belgian fishing activity in ICES 29E4 occurs outside the SCI itself. In 2012, 26 Belgian vessels operated in the northern parts of ICES rectangle. The majority of French fishing activity in ICES 29E4, occurs outside to the north west of the SCI itself. In 2012, 46 French vessels reported a VMS position at a speed of 1-6 knots within the western part of the Cape Bank section of the SCI.

7.5.7 The Belgian Fishery primarily target Sole in this area and the French target Haddock and Cod. Using the methodology referred in Annex B "Analysis of NON-UK Vessels in ICES rectangles", it has been estimated that in 2012:

- The quantity of tonnes landed from Belgian activity within the accessible portion of the SCI is estimated at 0.44 tonnes. This equates to a value estimated at £1,749
- The quantity of tonnes landed from French activity within the accessible portion of the SCI is estimated at 24.98 tonnes. This equates to a value estimated at £44,036

7.5.8 However, Figures 3 and 4 indicate that most fishing activity is concentrated on the North Western corridor of the site, which is outside of the proposed prohibited area (reef feature and buffer). The actual estimated loss of landings is therefore considered to be much lower than the values estimated above. Please refer to Annex B for further information on Non-UK fishing activity in and around the proposed prohibited areas.

7.6 Likely effects on fishing fleet from closure

7.6.1 As the estimated loss of landings is expected to be an over estimate (as a result of the limited fishing activity using bottom towed gear over the bedrock reef feature) it is expected that the impact on the fishing fleet from this closure will be limited. A number of affected fishers stated during pre-consultation meetings that bottom towed gear is not deployed over the bedrock reef feature as this would damage their gear. The French and Belgian fishing industry representatives confirmed that there will be a loss of fishing grounds around the Western and Northern areas of the Cape Bank prohibited area however, alternative fishing grounds are easily accessible.

7.7 Adaptability

7.7.1 In order to assess the likely effects of the proposed closure on fishing activities, the extent to which vessels would be able to maintain the value of the catch by moving effort to other areas needs to be assessed.

7.7.2 Fishers were asked to complete a questionnaire to inform this assessment and were asked directly as to the degree of displacement incurred to other areas as a result of the proposed closure, and their ability to fish on alternative grounds and adapt in order to maintain catch value. A number of affected fishers stated that they could not change fishing grounds or gear type but as this proposed option will only limit fishing activity over the bedrock reef feature and within the buffer, the potential for displacement will be minimal.

7.7.3 As a result of introducing the preferred option (a specified prohibited area byelaw) rather than closing the whole site, the level of displacement from vessels using bottom towed gear will be minimised. French and Belgian fishing industry representatives confirmed during pre and formal consultation that fishing activity occurs in the proposed prohibited area. However, the degree of displacement and alternative fishing grounds were not specifically commented on.

7.7.4 It is envisaged that proof of advances in gear technology and impact on sensitive features will be considered during the amber/green process.

7.8 Indirect costs

7.8.1 Environmental costs

7.8.2 For the recommended option, there will be minimal potential for increased costs in terms of fuel for vessels travelling further afield to access alternative fishing grounds as most fishers have indicated that they do not fish in this area and alternative fishing grounds are easily accessible.

7.9 Administrative and enforcement costs

7.9.1 The MMO will undertake intelligence led, risk based enforcement approach as adopted by a number of regulatory bodies across government in accordance with the National Intelligence Model[15]. Where intelligence suggests non compliance or a risk of non-compliance, MMO will develop an enforcement strategy specific to the needs of the MPA and where necessary deploy resources accordingly. This may include a Navy presence, aerial surveillance or joint operations with other agencies (for example the IFCAs, UK Border force or EA). The MMO would coordinate any joint operations. The principals by which the MMO will regulate MPAs are set out by the Legislative and Regulatory Reform Act 2006 and the Regulators' Compliance Code and aim to ensure that the MMO is proportionate, accountable, consistent, transparent and targeted in any enforcement action it takes[16].

7.9.2 The enforcement of the proposed byelaw will be met within the current budget. The EU VMS will be used as a management tool for sea and air enforcement of over 12m vessels. As a result of the low fishing activity within the site, the risk of non-compliance will be minimal or low risk[17]. Table 2 highlights the estimated enforcement costs for the management of this preferred option.

Table 2: Annual additional costs of enforcement of recommended option[18]

Activity	Cost per unit (£)	Estimated number of units per year	Total cost per year(£)
Royal Navy surface surveillance per site	£,4,000 per day	1	£4,000
Joint enforcement patrols with local SFC/IFCA per site	Between £800-1,000 per day	5	£4,000-5,000
Aerial surveillance per site	£ 2,050 per hour	2	£4,100
Investigations/prosecutions per site	£10,375 per case	1	£10,375
Total		**9**	**£22,475 – 23,475**

[15] www.marinemanagement.org.uk/about/documents/risk-based-enforcement.pdf
[16] www.marinemanagement.org.uk/about/documents/compliance_enforcement.pdf
[17] This risk rating was identified from original submission for Defra's revised approach to minister.
[18] Enforcement cost estimates from original submission for Defra's revised approach to minister.

Table 3: Annual profile of monetised costs of recommended option- (£m) constant prices

	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9
Transition cost	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Annual recurring cost – Best estimate	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975
Low	0.022475	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975
High	0.023475	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975	0.022975
Total present value of annual costs*:										£0.2m
*For the estimation the Impact Assessment Calculator (https://www.gov.uk/government/publications/impact-assessment-calculator--3) was used considering a 3.5% discount rate, a 10 years appraisal period and 2013 as the price and present value base year.										

7.10 Benefits of recommended option

7.10.1 The exclusion of bottom towed gear from the proposed prohibited area would prevent the use of bottom towed gear over the bedrock reef feature and result in the following benefits:

- Environmental benefits of maintaining bedrock reef habitats

Environmental benefits are described here as non-monetised benefits.

7.11 Environmental benefits

7.11.1 The bedrock reef within the SCI are some of the most biologically diverse in the country and play an important role in supporting species that are considered rare or are occurring at the limit of their biogeographical distribution. Although the individual reefs are relatively small (both on a national and local scale), they are ecologically diverse and represent a locally significant area (in terms of their size) of permanently submerged, offshore reef habitat[2].

7.11.2 The SCI comprises two main areas of reef that are almost entirely granite (Axelsson & Dewey, 2011; Birchenough et al., 2008); an area of reef fringing the coast (the Land's End part of the SCI – the coastal upstanding reef sub-feature) and an area of upstanding reef further offshore in a broad, arching crescent that is roughly aligned with the coastline (the Cape Bank part of the SCI – the offshore upstanding reef sub-feature). The offshore upstanding reef will be managed by the MMO. This area contains kelp-dominated assemblages, bryozoan and hydroid turf communities, as well as areas grazed by echinoderms together with Ross coral *Pentapora fascialis*, the echinoderm *Echinus esculentus* and the rock-boring sponge *Cliona celata* (Birchenough *et al.*, 2008a). Water movement by currents and wave action also encourages dense growths of sponges, sea squirts, anemones and soft corals (Irving, 1996)[2].

7.11.3 Reefs also provide some degree of coastal protection and are important areas for nutrient cycling, carbon and nitrogen fixing and sediment stabilisation.

7.11.4 A protected reef habitat is a natural refuge for creating populations of targeted and bycatch species.

7.11.5 The benefits of this byelaw are to afford appropriate protection and a safeguarding of the ecological characteristics that can possibly lead to more abundance of biodiversity compared to the rest of the fishing grounds.

7.11.6 The environmental benefits from the introduction of this byelaw will be significant as it will protect the bedrock reef features within the site from bottom towed gear. This will contribute to meeting the 'maintain' conservation objective. This may promote more recreational use in the area such as divers and recreational anglers which could potentially benefit the local economy.

7.12 Socio-economic benefits

7.12.1 There is a possibility that the maintained condition of the bedrock reef feature and habitat may increase the attraction for recreational users, including divers and anglers (Rees *et* al, 2013[19]; Chae *et al*, 2012[20]). This could also increase tourism to the area and therefore increase spending in local businesses (Rees *et* al, 2013).

7.12.2 Implementing a zoned approach to management rather than closing the whole site limits the displacement of vessels operating bottom towed gear.

7.13 **Distribution of costs and benefits**

7.13.1 The distribution of social and economic costs is predominantly at a UK, French and Belgian local level (excluding the enforcement costs) with the overall environmental benefits covering a wider area and having more of a national impact.

[19] Rees, S.E., Attrill, M.J, Austen, M.C,.Mangi, S.C,. Rodwell, L.D (2013). A thematic cost-benefit analysis of a marine protected area. Journal of Environment management, 114, 476 – 485.
[20] Chae, D., Wattage, P.,Pascoe,. S(2012). Recreational benefits from marine protected area: A travel cost analysis of Lundy. Tourism Management, 33, 971 – 977.

Annex A: Notes of UK fishery statistics data extraction and tables

Data tables that summarise reported activity within the ICES rectangles that cover the detailed areas defined as the European marine site areas are detailed on the MMO website[21].

This level of detail reflects the finest level of detail available to UK fisheries administrations.

This data provides the information on the quantity and value of landings from the ICES rectangles covering the areas, along with details of the vessels, gears used, and the species caught.

In addition to this fishing activity data, vessels over 15 metres in length report their exact position every 2 hours as part of UK Vessel Monitoring Systems.

For these over 15 metre vessels, it has been possible to combine the relatively coarse scale of spatial data from the activity reporting systems, with the detailed position reports from the VMS systems to allow estimation of fishing activity at a finer scale. This detailed recasting of the activity data allows estimation of activity within the detailed EMS areas for over 15 metre vessels.

Where available this detail is presented in the tables of data alongside the overall activity within the ICES rectangles, for the over 15 metre vessels. The ratio between these two sets of data has then been applied to the data for other vessel lengths to provide approximate estimates of the activity within the proposed prohibited area by these vessels less than 15 metres overall length.

Please note that proposed prohibited area is within inshore waters, therefore using the proportion of activity carried out by over 15 metre vessels within the areas to estimate activity of other UK vessels may be inaccurate as the larger vessels tend to fish further offshore than others, especially the over 10 metre fleet.

This data is shaded grey in the tables to highlight that is it estimated data and should only be used with caution.

[21] http://www.marinemanagement.org.uk/protecting/conservation/ems-consultation.htm

Annex B: Notes of Non-UK fishery statistics data

Data is reported by Member States to the Scientific, Technical and Economic Committee for Fisheries (STECF) working group on fishing effort regimes.

As part of the activities of this group, various data sets are compiled including the details for each Member State of landings of species for each ICES rectangle with associated vessel groupings. This data set is constructed to meet the needs of the STECF group and as such it has had to be processed carefully to avoid double counting of activity data. It has been sourced from the STECF site.[22]

Summary totals have been checked against the recorded activity on the EU FIDES systems for certain quota stocks to validate the data reported.

However, there remain differences in the totals between those reported for species/area combinations in the STECF data files and those reported for similar levels of detail as part of the catch reporting systems on FIDES for monitoring quota uptake. As such these figures are indicative of the level of activity in the area by the Member States involved and not definitive statements.

Indicative monetary values have been constructed using the average value of landings by UK vessels from the ICES rectangle concerned or similar areas.

Where data for years are missing it may be indicative of no activity being reported but it may be a result of no data having been supplied.

ANALYSIS OF NON-UK VESSEL VMS ACTIVITY IN ICES RECTANGLES COVERING THE SCI RELATING TO THIS IMPACT ASSESMENT

Methodology used:
This analysis is the results of applying the standard methodology used to identify whether or not UK vessels have been active in a particular detailed spatial area to the information received for non-UK vessels, in particular those from France and Belgium with historic access rights to certain part of UK inshore waters.

It involves the estimation of fishing activity from VMS data based on the speed of the vessel as reported within the VMS messages ("Pings")

Data for each VMS Ping received from Non-UK vessels in the rectangle or rectangles concerned that cover the detailed area are selected from the UK VMS system, extracting details of the vessel identity (CFR) number, position and speed and the date and time of the Ping.

Each Ping is assessed and classified as indicative of fishing activity taking place if the speed is >=1 or <=6 knots

These fishing pings from the rectangle(s) concerned are then processed in GIS software to identify if the position was inside or outside the details spatial area concerned.

This allows the proportion of fishing pings recorded for each Member State within the rectangle that were inside the detailed area to be calculated. This factor will then be applied to the overall

[22] STECF: http://stecf.jrc.ec.europa.eu/documents/43805/594796/2013_App+08+landings+by+rectangle+by+country.xlsx

level of landings seen within the STECF data sets for the Member State concerned to allow estimates of activity by non-UK vessels within the detailed spatial area to be constructed.

SUMMARY OF ACTIVITY BY BELGIAN AND FRENCH VESSELS IN ICES RECTANGLE 29E4 COVERING THE LANDS END AND CAPE BANK SITE

This is a summary of the activity by Member State vessels in terms of the quantity and value of fish landed in terms of:

(1) Total activity within the ICES rectangles covering the area concerned using bottom towed gears.
(2) Estimates of activity within the specific area concerned using bottom towed gears

Part A - total tonnage of activity:

		(1)				(2)			
		Activity (Tonnes) in ICES rectangle 29E4				Activity (tonnes) estimated as from within the SCI based on maximum VMS activity in 2010-2012			
Belgium	**Gear Code**	**2009**	**2010**	**2011**	**2012**	**2009**	**2010**	**2011**	**2012**
Over 15m in length	BT2*	105.77	76.81	121.77	352.38	0.13	0.10	0.15	0.44
	TR2**	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00
	29E4 Total	**105.77**	**76.81**	**121.77**	**352.73**	**0.13**	**0.10**	**0.15**	**0.44**

French	**Gear Code**	**2009**	**2010**	**2011**	**2012**	**2009**	**2010**	**2011**	**2012**
0 to15m in length	Beam	0.00	0.00	0.00	2.15				0.05
	Bottom Trawls	0.00	0.00	3.00	0.17			0.07	
	Dredge	0.00	0.00	9.63	0.00			0.23	
Over 15m in length	Bottom Trawls	0.00	0.00	940.59	1055.57			22.21	24.93
	Dredge	0.00	0.00	13.26	0.00			0.31	
	29E4 Total	**0.00**	**0.00**	**966.48**	**1057.89**	**0.00**	**0.00**	**22.82**	**24.98**

* BT2 = Beam Trawls - 80-119mm mesh size
** TR2 = Demersal Trawls - 70-99mm mesh size

Part B - total value of activity

		(1)				(2)			
		Activity (£) in ICES rectangle 29E4				Activity (£) estimated as from within the SCI based on maximum VMS activity in 2009-2012			
Belgium	**Gear Code**	**2009**	**2010**	**2011**	**2012**	**2009**	**2010**	**2011**	**2012**
Over 15m in length	BT2	£442,857	£404,990	£705,959	£1,409,228	£549	£502	£876	£1,748
	TR2	£0	£0	£0	£522	£0	£0	£0	£1
	29E4 Total	**£442,857**	**£404,990**	**£705,959**	**£1,409,751**	**£549**	**£502**	**£876**	**£1,749**

		Activity (£) in ICES rectangle 29E4				Activity (£) estimated as from within the SCI based on maximum VMS activity in 2009-2012			
French	**Gear Code**	**2009**	**2010**	**2011**	**2012**	**2009**	**2010**	**2011**	**2012**
0 to15m in length	Beam	£0	£0	£0	£8,116	£0	£0	£0	£192
	Bottom Trawls	£0	£0	£4,898	£1,452	£0	£0	£116	£34
	Dredge	£0	£0	£15,722	£0	£0	£0	£371	£0
Over 15m in length	Bottom Trawls	£0	£0	£1,804,373	£1,855,331	£0	£0	£42,607	£43,810
	Dredge	£0	£0	£21,648	£0	£0	£0	£511	£0
	29E4 Total	**£0**	**£0**	**£1,846,641**	**£1,864,899**	**£0**	**£0**	**£43,605**	**£44,036**

* BT2 = Beam Trawls - 80-119mm mesh size
** TR2 = Demersal Trawls - 70-99mm mesh size