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Marine Scotland

North Western Waters Proposal

September 2016

Joint Recommendation regarding the protection of Special Areas of Conservation and Marine Protected Areas in North Western Waters, designated under the EU Habitats Directive 92/43/EEC of 21 May 1992 and the EU Marine Strategy Framework Directive 2008/56/EC of 17 June 2008, using the provisions of Article 11 and Article 18 of Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy

Contents

1 Summary of proposal

This Joint Recommendation contains a proposal for the regulation of fisheries activity and is initiated by the UK and submitted to the European Commission jointly by the UK and [insert Member States here], being those Member States who have a direct management interest. It presents fisheries management proposals for four Special Areas of Conservation (SACs) and four Marine Protected Areas (MPAs) located in the UK part of the North Western Waters area. These measures are considered necessary to comply with Article 6 of the Habitats Directive and Article 13(4) of the Marine Strategy Framework Directive.

2 Summary of recommendations to be implemented

2.1 Anton Dohrn Seamount SAC

The aim of the proposal is to protect Annex I reef (including stony, bedrock and biogenic reef) habitat from potential deterioration from fishing activity. The proposed measures would prohibit all demersal fishing gears within the SAC. Details of the proposal are in section A.

2.2 East Rockall Bank SAC

The aim of the proposal is to protect Annex I reef (including stony, bedrock and biogenic reef) habitat from potential deterioration from fishing activity. The proposed measures would prohibit all demersal fishing gears on a zonal basis within the SAC. Details of the proposal are in section B.

2.3 Geike Slide and Hebridean Slope MPA

The aim of the proposal is to protect burrowed mud (seapens and burrowing megafauna), offshore subtidal sands and gravels and offshore deep-sea mud habitats from potential deterioration from fishing activity. The proposed measures would prohibit all mobile demersal mobile fishing gears on a zonal basis within the MPA. Details of the proposal are in section C.

2.4 Rosemary Bank Seamount MPA

The aim of the proposal is to protect deep-sea sponge aggregations and seamount communities from potential deterioration from fishing activity. The proposed measures would prohibit all demersal fishing gears within the MPA. Details of the proposal are in section D.

2.5 Solan Bank Reef SAC

The aim of the proposal is to protect Annex I reef (including stony and bedrock reef) habitat from potential deterioration from fishing activity. The proposed measures would prohibit all mobile demersal fishing gears on a zonal basis within the SAC. Details of the proposal are in section E.

2.6 The Barra Fan and Hebrides Terrace Seamount MPA

The aim of the proposal is to protect offshore deep-sea mud and offshore subtidal sands and gravel habitats as well as burrowed mud (seapen and burrowing megafauna communities), seamount communities, and orange roughy from potential deterioration from fishing activity. The proposed measures would prohibit all demersal fishing gears on a zonal basis within the MPA. Details of the proposal are in section F.

2.7 West Shetland Shelf MPA

The aim of the proposal is to protect offshore subtidal sand and gravel habitats from potential deterioration from fishing activity. The proposed measures would prohibit all mobile demersal fishing gears on a zonal basis within the MPA. Details of the proposal are in section G.

2.8 Wyville-Thomson Ridge SAC

The aim of the proposal is to protect Annex I reef (including stony and bedrock reef) habitat from potential deterioration from fishing activity. The proposed measures would prohibit all demersal fishing gears on a zonal basis within the SAC. Details of the proposal are in section H.

3 Non-technical summary of control and enforcement requirements

It is envisaged that control and enforcement will be delivered through the Vessel Monitoring System (VMS), supplemented with risk analysis and deployment of aerial surveillance and ships to the areas as required. For some sites, enhanced VMS reporting is requested to aid compliance efforts.

4 Non-technical summary of how measures were designed

The measures in this document have been designed using a risk based approach. Intervention is only proposed for features where it is considered that interactions with fishing activity may pose a risk to achievement of the conservation objectives In designing the measures the pattern of fleet activity has been taken into account and will be allowed to continue as much as possible within the legal framework.

5 Non-technical summary of the economic analysis

VMS data has been used to estimate the amount of fishing effort that takes place within the relevant ICES rectangles. This is then used to estimate the amount that takes place within a protected area, and how much is affected by the proposed management measures. These proportions are multiplied by the reported catch values for ICES rectangles to provide a value for the MPA and impact of the management measures for each member state which provided data.

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6 Introduction

This joint recommendation contains a proposal for the regulation of fisheries activity and is initiated by the United Kingdom (UK) and submitted to the European Commission jointly by the UK and [insert Member States here], being those Member States having a direct management interest in the sea area where measures are being proposed.

The overall aim of this joint recommendation is to ensure that fisheries are managed in accordance with Article 6 of the EU Habitats Directive[1], and Article 13 of the EU Marine Strategy Framework Directive (MSFD)[2].

It is the intention of the UK government (as the initiating Member State) to take forward measures in respect to fisheries activities exercised by all vessels including those carrying the flag of other EU Member States. The proposals in this document have been developed in accordance with Article 11 and Article 18 of Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy (the CFP[3]).

[1] Council Directive 92/43/EEC, of 21 May 1992, on the conservation of natural habitats and of wild fauna and flora:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1992L0043:20070101:EN:PDF

[2] Council Directive 2008/56/EEC, of 17 June 2008, establishing a framework for community action in the field of marine environmental policy:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:164:0019:0040:EN:PDF

[3] Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:354:0022:0061:EN:PDF

7 Principles

This section describes the legal framework designation of Marine Protected Areas (MPAs) and Special Areas of Conservation (SACs), and the implementation of fisheries management measures. It also describes certain aspects of our approach which is applicable to all sites. There is also a summary of how we have engaged stakeholders.

7.1 Common Fisheries Policy

According to Article 11 of the CFP Member States are empowered to adopt conservation measures that are necessary to comply with their obligations under Article 6 of the EU Habitats Directive and Article 13(4) of the MSFD.

Where measures are required outwith waters where the member state has exclusive competence the European Commission (EC) is empowered to adopt such measures by means of delegated acts.

The initiating Member State shall provide the EC and Member States who have a direct management interest with relevant information on the measures required, including their rationale, scientific evidence in support, and details on their practical implementation and enforcement.

Member States shall consult the relevant Advisory Councils.

The initiating Member State and the other Member States who have a direct management interest may submit a joint recommendation within six months from the provision of sufficient information.

The Commission shall adopt the measures, taking into account any available scientific advice, within three months from receipt of a complete request.

The 11 information items described in the EU guidance for developing fisheries management for MPA document[4] provides the basis for the content of this proposal. It describes how the United Kingdom, as the initiating Member State, has taken the Commission's criteria for decision making into account as well as the requirements for regional coordination in line with the CFP.

7.2 Implementation of Natura 2000 in United Kingdom

The following regulations, as amended from time to time, provide the legal basis for the designation of Natura 2000 sites according to the EU Habitats Directive (92/43/EEC) and the EU Wild Birds Directive (2009/147/EC) in the UK. These regulations also transpose the protective provisions of Article 6 of the EU Habitats Directive into UK law.

a) The Offshore Marine Conservation (Natural Habitats, &c) Regulations 2007[5] in relation to the offshore area around the UK. The offshore area extends from the limit of the territorial sea to the UK Continental Shelf Claim Limit.

b) The Conservation of Habitats and Species Regulations 2010[6] in relation to English and Welsh Territorial Waters

c) The Conservation (Natural Habitats, &c.) Regulations 1994[7] in relation to Scottish Territorial Waters.

[4] http://ec.europa.eu/environment/nature/natura2000/marine/docs/fish_measures.pdf

[5] http://www.legislation.gov.uk/uksi/2007/1842/contents/made

[6] http://www.legislation.gov.uk/uksi/2010/490/contents/made

[7] http://www.legislation.gov.uk/uksi/1994/2716/contents/made

7.3 Designation of Natura 2000 sites in United Kingdom

Special Areas of Conservation (SACs) are designated for habitats and species listed in Annex 1 and 2 of the EU Habitats Directive. The UK currently has 108 SACs with marine components, covering 7.6% of the UK sea area. Eighty eight of these SACs are completely in inshore waters[8], 16 are completely in offshore waters[9], and there are four sites which have parts in both inshore and offshore waters. Those with offshore components are shown in figure 1 below.

7.4 Implementation of Article 13(4) of Marine Strategy Framework Directive in United Kingdom

The following Acts of Parliament provide the legal basis for the designation of sites to comply with Article 13(4) of the MSFD in the UK.

a) The Marine and Coastal Access Act 2009[10] (as amended) provides for the designation of Marine Conservation Zones or Marine Protected Areas in UK offshore waters, and English Inshore waters.

The Marine (Scotland) Act 2010[11] provides for the designation of Marine Protected Areas in Scottish Inshore waters.

7.5 Designation of sites under Article 13(4) of Marine Strategy Framework Directive in United Kingdom

Each of the four devolved administrations within the UK are responsible for the identification, designation and management of protected sites within their respective marine waters.

[8] http://jncc.defra.gov.uk/page-4170

[9] http://jncc.defra.gov.uk/page-1455

[10] http://www.legislation.gov.uk/ukpga/2009/23/contents

[11] http://www.legislation.gov.uk/asp/2010/5/contents

The Scottish Government has designated 30 MPAs under article 13(4) of the MSFD. Of the 30 MPAs, 17 are in territorial waters and 13 in offshore waters. Management measures for all these sites are expected to be implemented by the end of 2017. Those with offshore components are shown in figure 1 below.

7.6 Sites in North Western Waters

There are thirteen sites in the Scottish part of North Western Waters, as shown in figure 2. This document includes proposals for eight of them.

7.6.1 Sites being considered in this document

In this document there are proposals for management measures for 8 sites in the North Western Waters. These are listed below and shown in figure 2.

Anton Dohrn Seamount SAC

East Rockall Bank SAC

Geikie Slide and Hebridean Slope MPA

Rosemary Bank Seamount MPA

Solan Bank Reef SAC

The Barra Fan and Hebrides Terrace Seamount MPA

West Shetland Shelf MPA

Wyvile-Thomson Ridge SAC

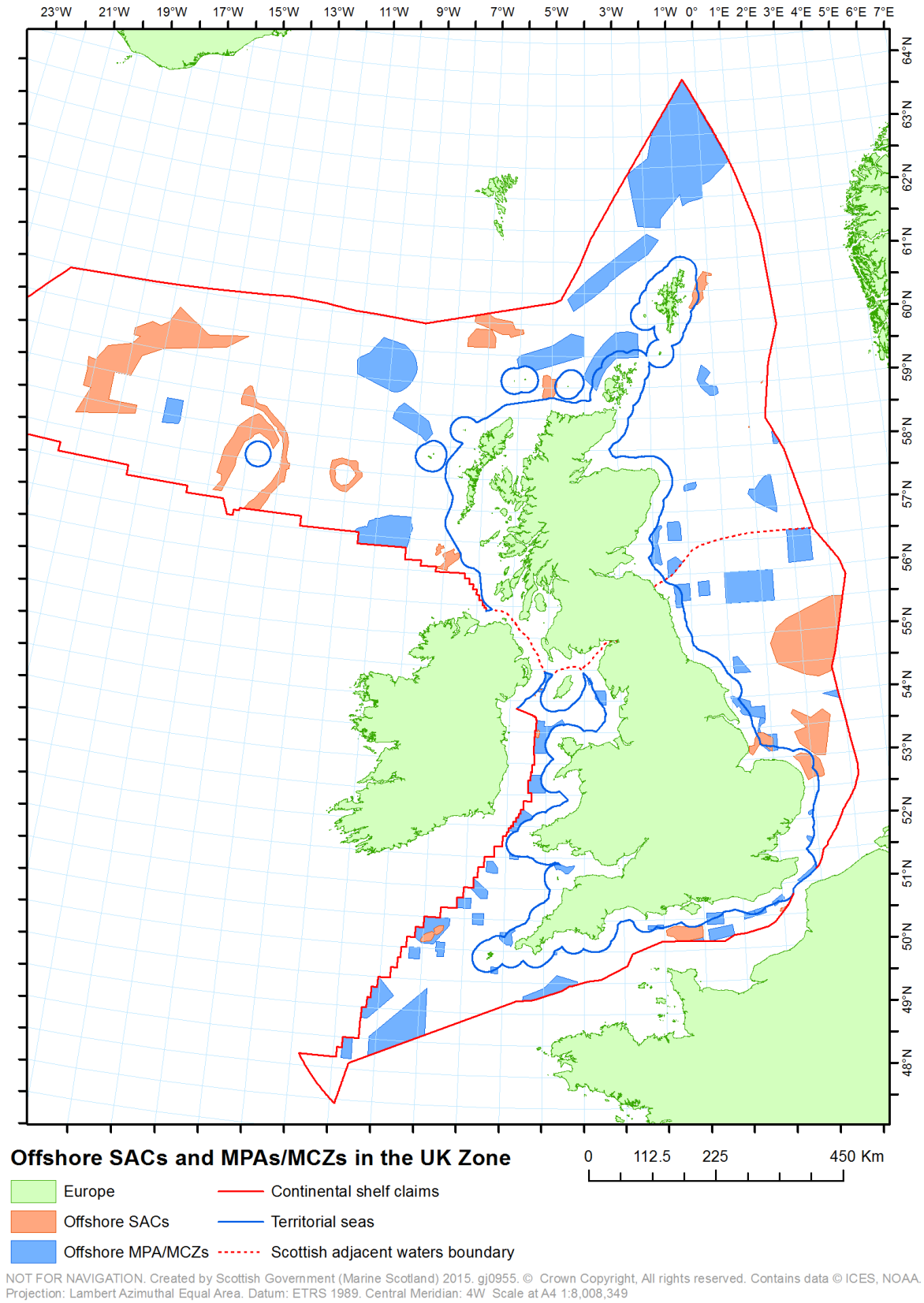

Figure 1: UK offshore Special Areas of Conservation (including candidates), Marine Protected Areas, and Marine Conservation Zones

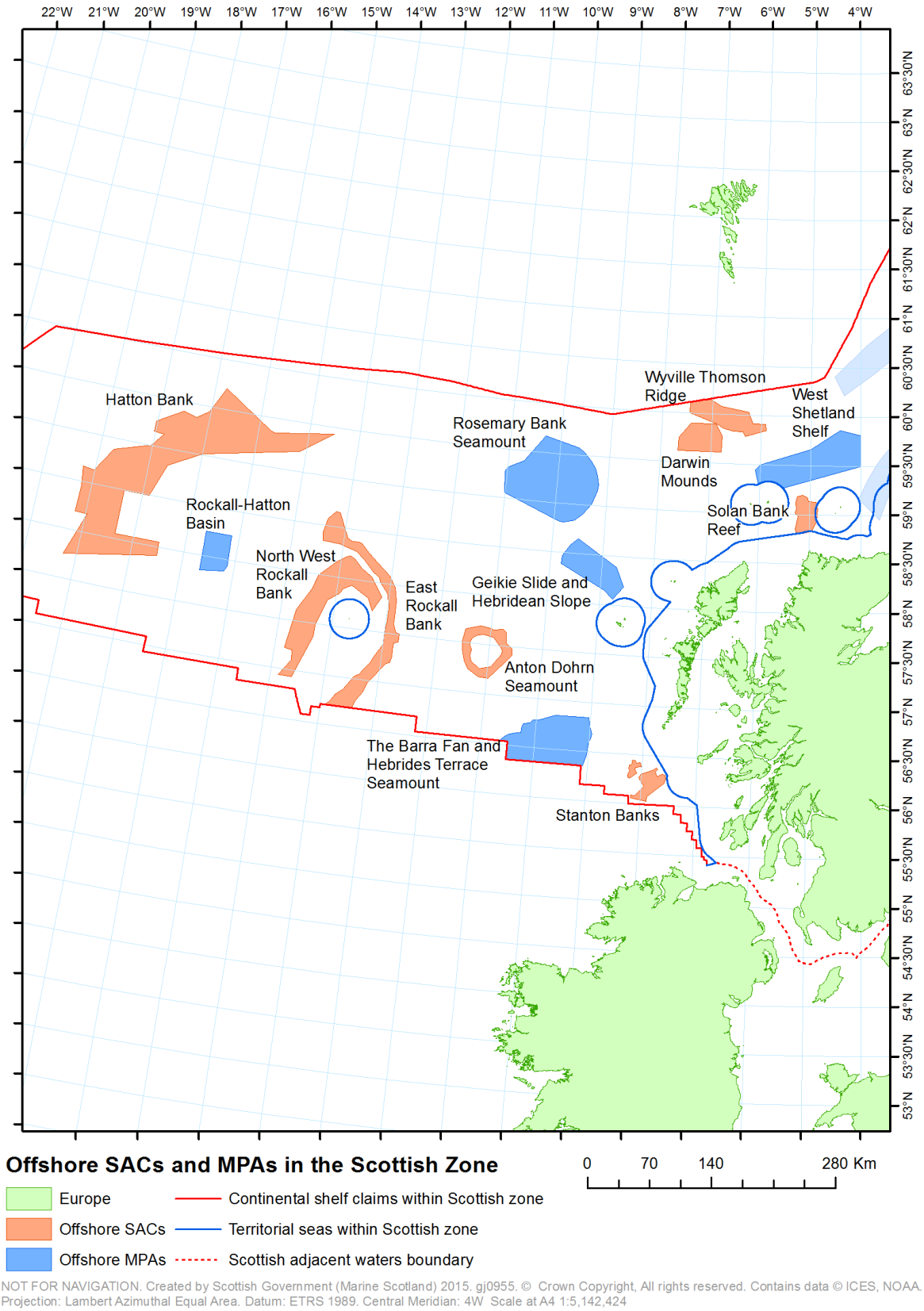

Figure 2: UK offshore Special Areas of Conservation and Marine Protected Areas in the Scottish part of North Western Waters.

7.6.2 Summary of other sites in North Western Waters

In Scottish waters, there are a further five offshore MPAs in the NWW region that are not being considered within this document. Three of the five sites already have specific fisheries measures in place and are therefore considered to be well-managed. These are Darwin Mounds SAC, Hatton Bank candidate SAC (site not yet adopted by the European Commission), and North-West Rockall Bank SAC

A fourth site, Hatton-Rockall Basin MPA, is located in the area under fisheries jurisdiction of the North East Atlantic Fisheries Commission (NEAFC). Its location is outwith the defined existing fishing area footprint. This means a full impact assessment would be required before any fishing operations could commence.

The final site is Stanton Banks SAC which is subject of an earlier separate proposal which is the subject of on-going negotiations with other member states.

7.7 Scientific basis

7.7.1 Risk based approach

A range of MPA fisheries management options are available to managers, differing in the degree of restriction they would place on fishing operations, and the risk they would pose to achieving the conservation objectives. These have been grouped into three broad categories of possible management: No additional management, additional management to reduce/limit pressures and additional management to remove pressures.

Although it is not generally possible to quantify the degree of risk to achieving the conservation objectives posed by each option, it is possible to identify where risks may exist, and where this could be reduced through the introduction of management measures.

Risks have been evaluated using existing data and information on protected features and our understanding of the relationships between the feature and relevant activities. This relationship determines how much flexibility is available to managers in the design of measures. There tends to be little flexibility in designing measures for the most vulnerable features, whereas less sensitive habitats lend themselves to more creative management solutions.

7.7.2 Independent review

Depending on the outcome of this initial consultation independent review and/or advice may be sought. This will be done where there is a significant difference of opinion over the design of the measures.

7.8 Engagement

7.8.1 Stakeholder workshops

Stakeholder workshops were held in April 2014 and March 2015 to discuss potential fisheries management measures for the offshore SAC and MPA sites. These workshops were attended by fishing industry representatives, environmental Non-Governmental Organisations and marine scientists.

The proposals for each site take into account views expressed at each workshop and aim to balance protection of the marine ecosystem against socio-economic fishing interests.

7.8.2 Co-ordination and consultation with other member states

To be completed

7.8.3 Involvement of the North Western Waters Advisory Council

Members of the North Western Waters Advisory Council (NWWAC) participated in the workshops where the measures were initially designed.

A presentation of the developing measures was made to the NWWAC in February 2016.

To be completed

7.8.4 Involvement of the North Western Waters Member States Group

A presentation of the developing measures was made to the Article 11 subgroup in April 2016.

To be completed

7.8.5 Public participation

To be completed

7.9 Transparency

In this proposal the UK has been transparent on the data being used, the steps being taken and the methodology used, as well as the involvement of stakeholders.

Add more text during process

7.10 Proportionality

The approach was designed to deliver proportionate regulatory proposals. In other words, seeking to balance the need to achieve site conservation objectives whilst avoiding unnecessary restrictions to on-going fishing activities. The European Commission guidance describes such a proportionate approach towards balancing sustainable exploitation of resources and the application of a precautionary approach to conserve important habitats.

7.11 Non-discrimination

The measures in these proposals have been designed solely to address the risk posed by fishing gears to the protected features and/or the functioning of the ecosystem within the protected area

7.12 Site condition monitoring

Marine Scotland/JNCC are currently leading a research and development programme to develop an integrated system of monitoring for marine biodiversity across Scottish/UK waters.

The programme aims to provide a coherent framework for biodiversity monitoring to meet the requirements of existing and future monitoring and assessment obligations including those under the EU Marine Strategy Framework Directive, EU Habitats and EU Wild Birds Directives and the OSPAR Convention.

Monitoring and assessment of protected sites constituting the UK network of Marine Protected Areas will be an integral part of this programme.

Monitoring in UK offshore waters will be based on the principles outlined in the JNCC's Common Standards Monitoring Guidance (JNCC 2004).

In Scotland a protected area specific monitoring strategy is under development, with a draft version expected to be published in the near future.

7.13 Surveillance

7.13.1 Vessel Monitoring System

The provisions of Article 50 (3) and (4) of Council Regulation (EC) No 1224/2009 should be applied. Within each site section there is a recommendation for frequency of data transmission. Where possible this remains at the minimum requirement of once every 2 hours. However in some cases a variation is required due to scale of site or complexity of the management measures. Where a variation is recommended the change of frequency of data transmissions should commence immediately upon entry to the area, and end upon exit from the area.

Vessels not permitted to fish in the area in question must have all gear lashed and stowed during the transit so that it cannot be readily used. Transit should be at a speed of at least 6 knots except in the case of force majeure or adverse conditions. In such cases, the master shall immediately inform the fisheries monitoring centre of the flag Member State which shall then inform the competent authorities of the coastal Member State.

7.13.2 Aerial and surface surveillance

A risk analysis approach will be used to determine the frequency of surveillance. This will be a combination of routine patrolling to gather intelligence and specific patrolling to investigate potential breaches of the regulation.

8 Other human activities

Within the detailed site-level sections only activities which may impact on the protected features are considered. Those which do not have any effect are not detailed. For example commercial shipping passes through all of the sites in varying degrees of frequency. This is a surface activity whereas all of the protected areas are for benthic species/habitats. We have concluded that shipping has no effect on the protected areas under consideration. The same can be said of pelagic fisheries, which is why there is no further consideration of this activity within this document.

8.1 Requirement to assess licensed activities

Before giving consent to licensed activities the competent authority must ensure compliance with the underpinning legislation. These requirements are designed to prevent adverse impacts. This process does not apply to fisheries.

8.2 Future oil and gas development

A number of the protected areas overlap with license blocks identified by the Department for Business, Energy and Industrial Strategy (BEIS) and these may be subject to further oil and gas development in the future. Any such development will be subject to assessment.

9 Technical description of the fisheries activity analysis

The first step of the analysis was to estimate the amount of fishing effort for each gear type. The gear type for each UK vessel was identified from the EU logbook entry for each day of potential fishing activity. For non-UK vessels the main gear type from the EU fleet register was selected.

Taking all Vessel Monitoring System (VMS) reports where the speed was between 0 and 6 knots the following analysis was undertaken. Using ARCGIS the following spatial joins were performed sequentially; join to ICES rectangles; join to MPAs / SACs; join to management measures for that gear type.

Effort was then estimated by summing the time elapsed in hours since the last VMS report for each vessel. By country and gear type total effort for ICES rectangles; MPAs / SACs; and management measures was calculated. This was then tabulated as shown in the site level documents based upon the 5 year average from 2009 to 2013.

A call was made for catch value data from each member state. This was provided in slightly different formats so a suitable common approach was used. This involved taking the total catch value for each gear type for ICES rectangles where MPAs / SACs are located. A five year average per country per gear type for each group of ICES rectangles was calculated.

Using proportions from the effort analysis the estimated value for a fishery within MPAs / SACs was calculated, along with the value affected by the management measures. This data is tabulated as required and shown in the site level documents based upon the 5 year average from 2009 to 2013.

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Section A

11 Anton Dohrn Seamount Special Area of Conservation (SAC)

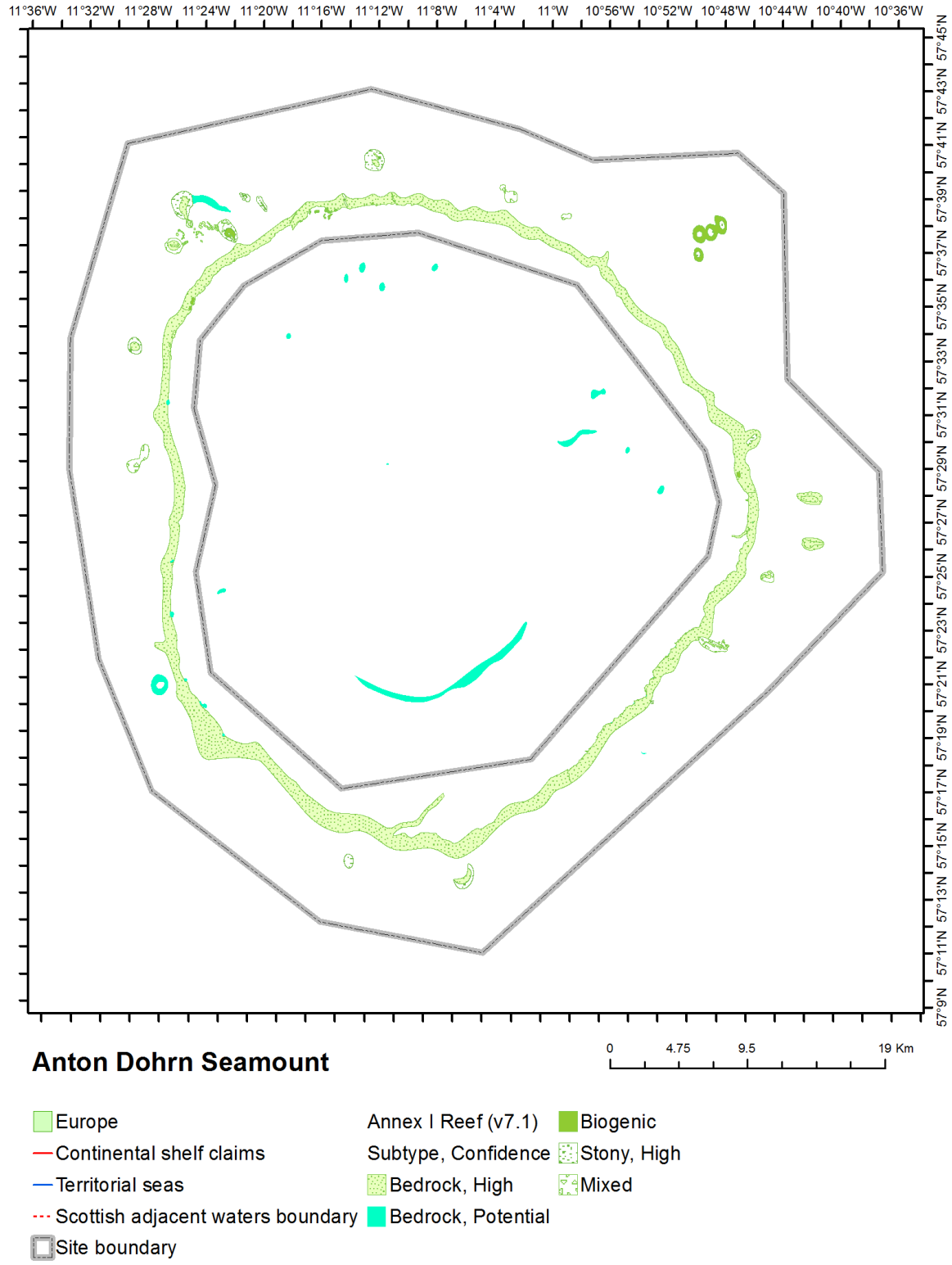
11.1 Site description

Anton Dohrn Seamount is located to the west of Scotland as shown in figure 2, about 200km from the Outer Hebrides in the Rockall Trough, a deep water channel in the North-east Atlantic. The seamount is a former volcano, roughly circular in shape, and was last active 40 – 70 million years ago. The area of the SAC is 1,429 km^2. The site contains approximately 128 km^2 of bedrock, stony and biogenic reef – sub-types of Annex I reef as shown in Figure A1.

The top is fairly uniform in depth (at 1,100m) and is surrounded by steep cliff slopes extending down towards a moat at ~2,400m water depth. The seamount is approximately 1,800m high from the deepest point of the moat to the crest, and about 40km in diameter (Long et al., 2010). On the lower flanks, parasitic cones occur that were formed when volcanic material erupted from lateral fractures rather than the central vent

The upper regions of the seamount flanks are bedrock reef grading to stony reef on the lower flanks. These habitats support assemblages of sea cucumbers, brittlestars, cup corals and sponges. At the base of the seamount flanks, bedrock and stony reef outcrop on ridges, extending radially from the centre of the seamount and on the parasitic cones.

In places there are dense aggregations of sea whips (or sea fans) and other corals, in communities known as 'coral gardens' (Figure A2). Also present is biogenic reef formed from *Lophelia pertusa* and *Solenosmilia variabilis* cold-water corals (Figure 2). This structurally complex habitat supports a diverse and unique range of fauna, including black corals, sea whips, soft corals and stony corals.



Projection: Lambert Azimuthal Equal Area. Datum: ETRS 1989. Central Meridian: 4W Scale at A4 1:325,100

Figure A1: Anton Dohrn SAC site map including distribution of protected features

11.2 Why the site was designated

Anton Dohrn Seamount is located in the Rockall Trough and Bank Regional Sea and represents hard bedrock reef of low topographic-complexity, stony reef, and biogenic *L. pertusa* reef in the deep circalittoral to bathyal zone. It therefore makes a contribution to the Natura 2000 network for Annex I reef habitat (H1170).

Dense aggregations of sea whips (or sea fans) and other corals form 'coral garden' communities. There is also biogenic reef formed by *L. Pertusa.* As OSPAR Threatened and/or Declining habitats, this SAC also makes a contribution to the OSPAR network.

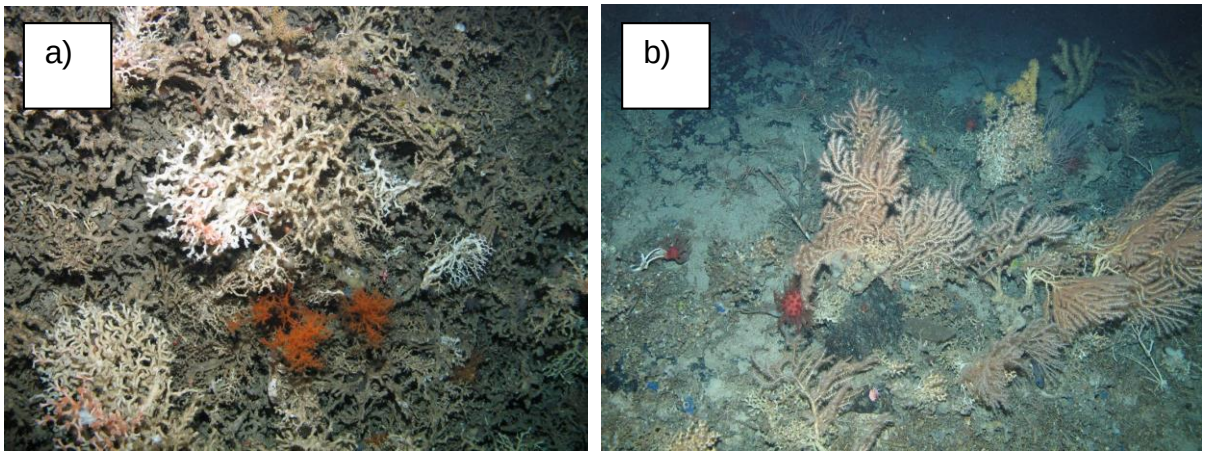


Figure A2: Examples of Annex I Reef feature and associated fauna within the Anton Dohrn Seamount SAC. a), dead sediment in-filled *Lophelia pertusa* framework on a mound feature with live *L. Pertusa* and *M. Oculata* growing on the coral debris and associated fauna includes *C. Cidaris* and *Actiniaria sp*; b) Coral garden habitat on a parasitic cone feature with dead *L. Pertusa*, gorgonains, antipatharians and abundant associated fauna. (©JNCC)

11.3 The site boundary

The site boundary for Anton Dohrn Seamount was defined using the JNCC marine SAC boundary definition guidelines (JNCC, 2012a). The boundary encloses the minimum area necessary to ensure protection of the Annex I habitat. The boundary has been drawn in a ring shape that incorporates the Annex I habitats but excludes the central summit of the seamount. As the summit mostly comprises sands and gravels it was removed to reduce the area of 'non-interest-feature' included within the site boundary (JNCC, 2012a).

A buffer of 2,000m has been applied at the summit edge, and 4,000m at the foot of the seamount slope. These represent two times the water depth at the respective location.

11.4 Conservation objectives

The conservation objective for the Anton Dohrn Seamount SAC is, subject to natural change, to restore the reef to favourable condition, such that:

- the natural environmental quality is restored;
- the natural environmental processes are maintained; and
- the extent, physical structure, community structure, diversity and typical species representative of bedrock, biogenic and stony reef in the Rockall Trough and Bank regional sea are restored.

12 Anthropogenic pressures

12.1 All demersal mobile gears (including dredge, beam trawl, bottom trawl, and seines)

Whilst it is unlikely that mobile bottom contact gear can affect the long-term natural distribution of bedrock and stony reef features, there is evidence to indicate that the use of bottom contacting mobile gears can impact the structure and function of the habitat and the long term survival of its associated species.

The animal communities found on bedrock and stony reefs on seamounts tend to be composed of erect and fragile species that are sensitive to physical disturbance, particularly deep-sea stony corals, gorgonians and black corals, sea anemones, hydroids and sponges (Clark & Tittensor, 2010; Clark et al., 2010; Long et al., 2010)

The use of towed fishing gears is likely to cause damage or death of fragile, erect species, such as sponges and corals (Freese et al., 1999; Løkkeborg, 2005). Other species such as hydroids, anemones, bryozoans, tunicates and echinoderms may also be vulnerable (McConnaughey et al., 2000; Sewell & Hiscock, 2005). Where fragile, slow growing species occur, even low levels of fishing have the potential to change the structure and function of the habitats and may result in the loss of some characteristic species. Recovery from such damage is estimated to be measured on a decadal scale, depending on the environmental conditions (Clark et al., 2010; ICES, 2010).

Mobile bottom contact gears reduce the long-term natural distribution of cold water coral (biogenic reef) features, as well as impacting the structure and function of the habitat and the long term survival of its associated species. The passage of towed fishing gear may increase mortality of the coral by crushing, burying or wounding corals, increasing susceptibility to infection and epifaunal recruitment that may eventually smother corals (Fosså et al., 2002).

The passing of a heavy trawl reduces the three-dimensional structure of the coral to rubble, decreasing the complexity of the habitat with impacts on the associated community composition (Koslow et al., 2001; Fosså et al., 2002).

Indirect impacts on cold water coral reefs from trawling are from increased levels of suspended particles in the water column causing smothering and polyp mortality (Larsson & Purser, 2011).

Corals are slow growing so any damage will take many years to repair (ICES, 2010).

12.2 All demersal static gears (including gillnets, trammel nets, long lines, pots and traps)

No studies providing evidence of the effects of static bottom contact gear on bedrock and stony reef on seamounts have been found, however impacts occurring on comparable vulnerable habitats and species, such as sponges and corals in Scottish waters are applicable (Muñoz et al., 2010). Impacts can arise from hooks, lines, nets and ropes becoming entangled with corals and other fragile species, including 'plucking' them from the sea bed during hauling (Mortensen et al., 2005; ICES, 2010; Muñoz et al., 2010; OSPAR, 2010). While the degree of damage from individual fishing operations is likely to be lower than for trawling, cumulative damage may be significant (ICES, 2010; Muñoz et al., 2010).

Static bottom contact gears are likely to reduce the long-term natural distribution of cold water coral (biogenic reef) features, as well as impacting the structure and function of the habitat and the long term survival of its associated species. Hooks, lines, nets and ropes entangle corals and may pluck them during hauling (Grehan et al., 2004; ICES, 2010). Physical damage to the seabed has been observed which may be caused by dragged anchors (Grehan et al., 2004; ICES, 2010). The individual impact of a single fishing operation may be slight but cumulative damage can be significant. Given the slow growth rate of the reefs, they may take centuries to recover from damage, if at all (ICES, 2010).

13 Proposed fisheries management measures

This section provides details of how the measures were determined.

13.1 Options considered for fisheries management

Table A1 provides a summary of the management advice set out against the various options that have been considered.

Table A1: Summary of fisheries management advice

Activity	Management options considered
Demersal mobile gear	**No additional management:** The conservation objectives for the biogenic reef feature would not be met under this option. There is a significant risk of not achieving the conservation objectives for the bedrock and stony reef features.
	Reduce/limit pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature. Appropriate management could include exclusion of mobile bottom contact gears over the main areas of bedrock and stony reef and all known areas of biogenic reef, allowing fishing to continue in fishable areas around the features. It is possible that these areas may include some areas where the distribution of reef is unknown or uncertain, and some very small areas of known bedrock and stony reef and there would therefore be a risk of localised damage to the structure and function of reef communities in these areas. The location of areas to be covered by management restrictions would include a buffer zone to reduce any risk of accidental contact with the feature.
	Remove/avoid pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature within the site boundary to the lowest possible levels. Restrictions would be required for all mobile bottom contact gears within the full extent of the site boundary. ICES have recommended closure to all bottom contact gears of an area similar to the SAC but with a slightly shallower outer boundary (ICES, 2011). If implemented, this would provide a level of protection equivalent to the remove/avoid option.
Demersal static gear	**No additional management:** The conservation objectives for biogenic reef would not be met under this option. There is a risk of not achieving the conservation objectives for the bedrock and stony reef features.

Activity	Management options considered
	Reduce/limit pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature. Appropriate management could include closure of the known extent of the biogenic reef feature within the site. However, a risk of impact with patches of feature not identified during survey would remain. The location of areas to be covered by management restrictions would include a buffer zone based on fishing warp length to depth ratio, to reduce any risk of accidental contact with the feature. The location of areas to be covered by management restrictions would be decided in consultation with fishers.
	Remove/avoid pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature within the site boundary to the lowest possible levels. Restrictions would be required for all bottom contacting static gears within the full extent of the site boundary. ICES have recommended closure to all bottom contact gears of an area similar to the SAC but with a slightly shallower outer boundary (ICES, 2011). If implemented, this would provide a level of protection equivalent to the remove/avoid option.

13.2 Proposed management option and rationale

Table A2 provides details of the chosen management approach and further explanation is provided below.

Table A2: Chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Annex I reef (1170)	Demersal mobile and static gear	Remove / avoid pressure	Prohibit all demersal towed and static gears from the SAC

The presence of biogenic reef with the site means that the measures need to manage both demersal mobile and static fishing gears.

13.3 Other fisheries measures which apply to the site

The current restrictions on gill net activity (EC No 850/98 as amended by EU No 227/2013) mean that this activity is effectively prohibited from the SAC as there is only a small area at the top of the seamount where depth is less than 600m. This makes a contribution to furthering the conservation objectives of the site.

It should be noted that the part of this proposal to prohibit trawling in waters greater than 800m depth may be overtaken by the new EU-wide Deep Sea Fisheries Regulation. This is expected to come into force in early 2017.

14 Measures envisaged for control, enforcement, and compliance

This section describes the measures that are proposed for implementation.

14.1 Vessel Monitoring System

The frequency of data transmissions shall remain at least once every 120 minutes.

14.2 Key provisions to include in EC regulation

Table A3 provides details of the gear types to be prohibited by the measures and Table A4 provides co-ordinates of the area to which the measures should be applied. Table A5 provides for an excepted area where the measures do not apply. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figure A2.

Table A3: Demersal fishing gears to be prohibited

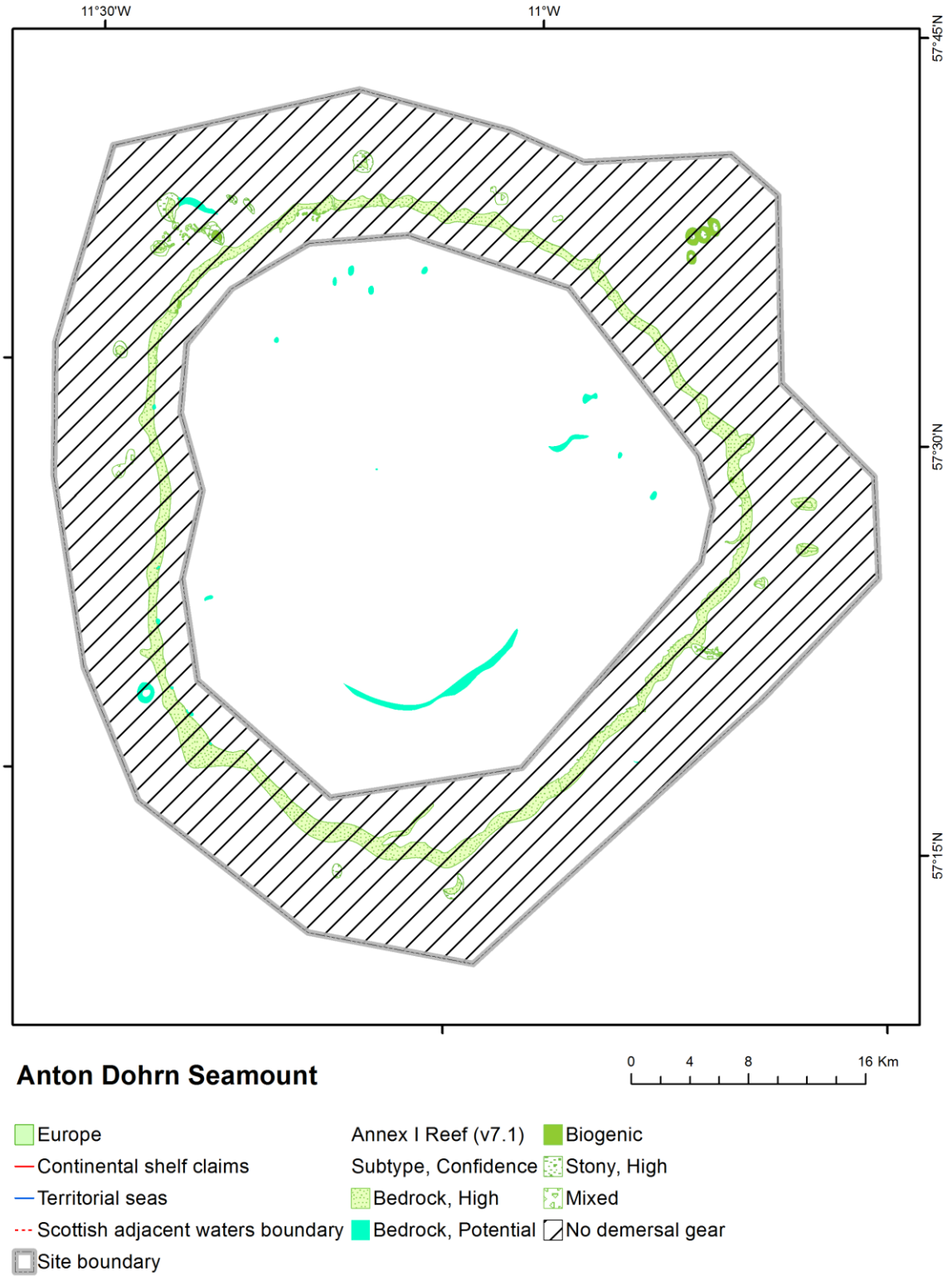
Gear types to be prohibited by the proposed measures	Habitat code	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	H1170	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredge		DRB	DRB, DRH
Gillnets and entangling nets		GN, GNC, GND, GNS, GTN, GTR	GEN, GN, GNC, GND, GNS, GTN, GTR
Hooks and lines		LHM, LHP, LL, LLD, LLS, LTL, LX	LHM, LHP, LLS, LLD, LL, LTL, LX
Pots and traps		FIX, FPO	FIX, FPO, FYK

Table A4: Co-ordinates of prohibited area (all demersal fishing gears)

Point	Latitude	Longitude
A	57° 38.170' N	011° 28.566' W
B	57° 41.129' N	011° 12.166' W
C	57° 40.191' N	011° 01.568' W
D	57° 39.299' N	010° 56.321' W
E	57° 40.098' N	010° 46.315' W
F	57° 38.744' N	010° 42.839' W
G	57° 31.874' N	010° 41.353' W
H	57° 28.748' N	010° 34.409' W
I	57° 25.041' N	010° 33.472' W
J	57° 20.160' N	010° 40.623' W
K	57° 09.482' N	010° 58.339' W
L	57° 10.035' N	011° 09.677' W
M	57° 14.244' N	011° 22.110' W
N	57° 18.935' N	011° 26.752' W
O	57° 25.810' N	011° 30.160' W
P	57° 30.734' N	011° 31.052' W

Table A5: Co-ordinates of area excepted from the prohibition

Point	Latitude	Longitude
Q	57° 31.153' N	011° 22.115' W
R	57° 33.350' N	011° 19.482' W
S	57° 35.303' N	011° 14.476' W
T	57° 35.965' N	011° 07.798' W
U	57° 34.620' N	010° 56.503' W
V	57° 28.924' N	010° 46.529' W
W	57° 27.044' N	010° 45.202' W
X	57° 25.010' N	010° 45.623' W
Y	57° 16.845' N	010° 56.398' W
Z	57° 15.060' N	011° 09.151' W
AA	57° 18.865' N	011° 18.932' W
AB	57° 22.541' N	011° 20.705' W
AC	57° 25.846' N	011° 19.977' W
AD	57° 28.627' N	011° 22.019' W



Projection: Lambert Azimuthal Equal Area. Datum: ETRS 1989. Central Meridian: 4W Scale at A4 1:325,100

Figure A3: Anton Dohrn Seamount SAC map of proposed measures

15 Fleet activity at Anton Dohrn Seamount SAC

In this section the potential effect of the measures on fishing effort and value is estimated. These estimates are based on data from 2009 to 2013 using the methodology described in section 9.

15.1 Fishing effort

The management measures for this site apply to all demersal fishing gears. Therefore tables A6 to A9 provides yearly average effort per gear type for the relevant ICES rectangles.

Table A6: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Anton Dohrn Seamount SAC using bottom trawl

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
FRA	43D8	1	0	0
FRA	43D9	4	0	0
FRA	44D8	4	3	3
FRA	44D9	5	4	4

Table A7: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Anton Dohrn Seamount SAC using static gear

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
DEU	43D8	40	6	6
DEU	43D9	11	1	1
DEU	44D8	11	3	3

15.2 Fishing value

Based upon the economic data provided by member states the value of the site, and the value of the management area can be derived. This is done by taking the proportion of the average for the relevant ICES rectangle based upon the amount of effort expended for each gear type in question. Table A10 show the average values derived for the reference period. This is depicted in Figures A4 and A5 through a kernel density estimation of Vessel Monitoring System data.

Table A10: Estimated economic value of fisheries at Anton Dohrn Seamount SAC (average of 2009 – 2013)

Nation	gear	Avg annual value in relevant ICES rectangles (Euro)	Avg annual value in SAC (Euro)	Of which avg value affected by management (Euro)
FRA[12]	bottom trawl	58,667	29,334	29,334
GER	all static	6,231	1,005	1,005

16 Assessment of potential displacement effects

The fishing effort that will be displaced amounts to only 17 hours per year on average. Therefore is not going to be any effects caused by displacement.

[12] Value comes out high when compared to the effort derived from VMS data

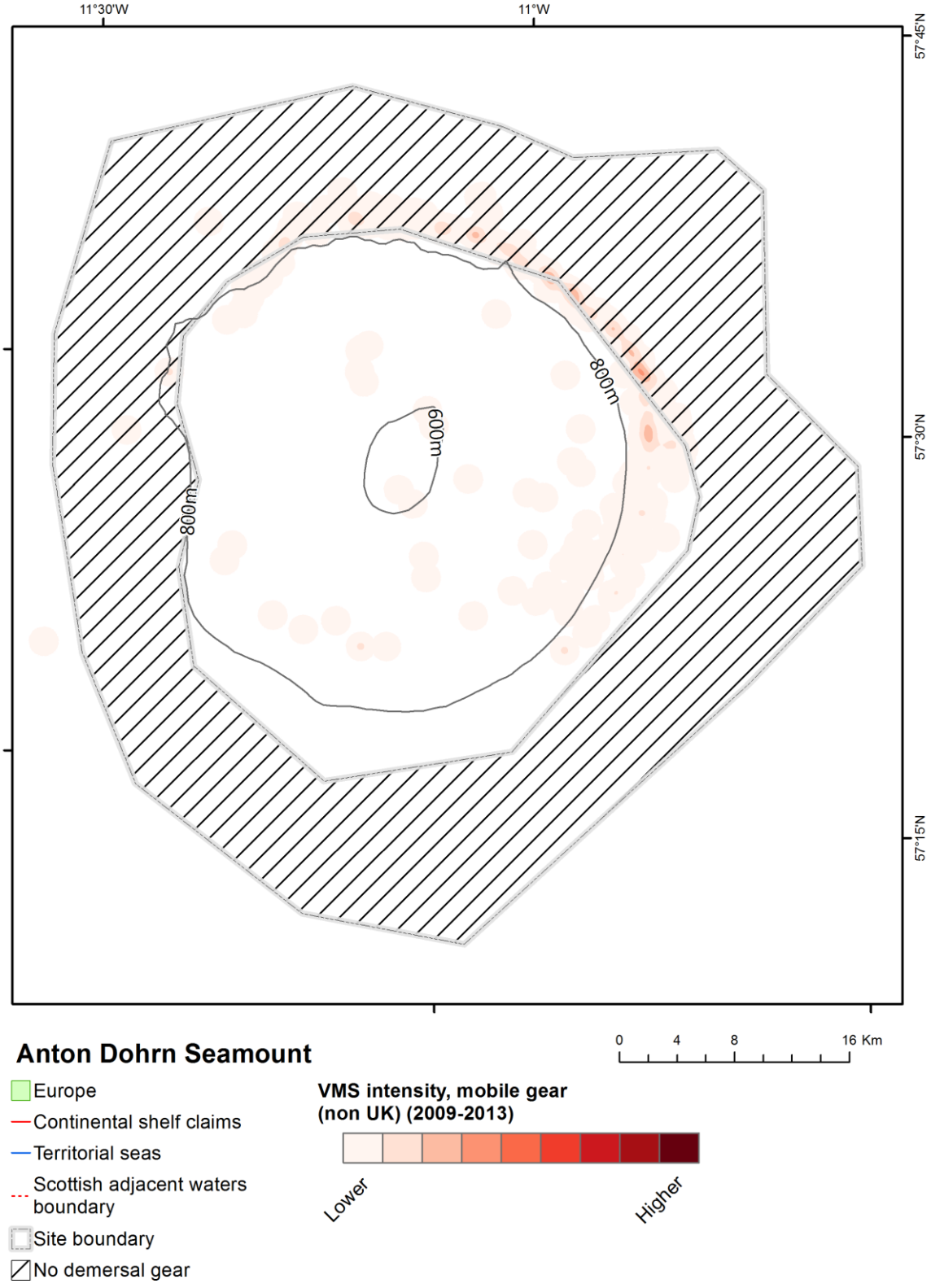


Figure A4: Anton Dohrn SAC map of proposed measures with mobile fishing VMS intensity layer for non-UK European Union vessels 2009-13

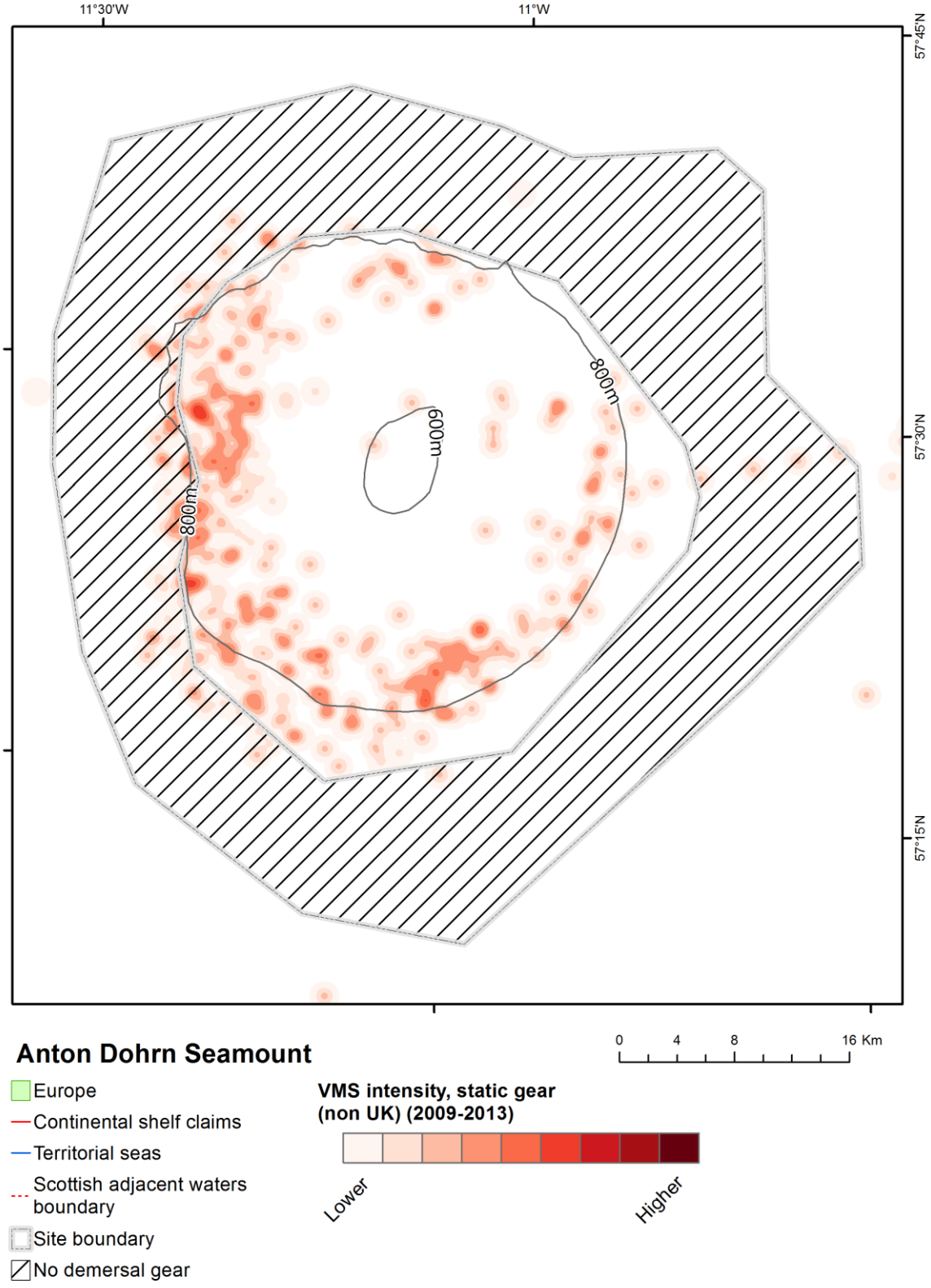


Figure A5: Anton Dohrn SAC map of proposed measures with static fishing VMS intensity layer for non UK European Union vessels 2009-13

Section B

17 East Rockall Bank Special Area of Conservation (SAC)

17.1 Site description

East Rockall Bank is located about 320 km west of the Outer Hebrides on the West coast of Scotland, as shown in figures 2 and B2. The site runs along the eastern flank of Rockall Bank, a geological feature approximately 450 km long and 200 km wide, orientated northeast to southwest, ranging in depth from 0 m (where a rocky 'island' outcrop breaks the surface) to 1000 m (Howell et al., 2009). The eastern edge of Rockall Bank forms a scalloped faulted scarp slope, which descends steeply down into the Rockall Trough at around 1000 to 1500 m water depth (Howell et al., 2009; Long et al., 2010).

The site comprises steep slopes, mixed substrates of boulder, cobbles and pebbles with areas of exposed bedrock and bedrock outcrop, with no one habitat type dominating (Howell et al., 2009).

Bedrock and stony reef along a steep cliff feature supports stylasterid corals and lobose and encrusting sponges. This habitat has not been observed elsewhere within the UK continental shelf, likely due to the depth of the feature which is shallower than most other deep sea structures (Long et al., 2010). Sediment in-filled dead *Lophelia pertusa* framework representing biogenic reef is situated on small mound features. Live biogenic reef is also represented on parasitic cones and in association with bedrock reef to the north of the site.

17.2 Why the site was designated

East Rockall Bank is located in the Atlantic North West Approaches, Rockall Trough and Faroe Shetland Channel Regional Sea. It represents a range of Annex I reef subtypes - hard bedrock reef of low topographic complexity, stony, and biogenic *Lophelia pertusa* reef in the deep circalittoral to bathyal zone. Therefore the site makes a contribution to the Natura 2000 network.

The OSPAR Threatened and/or Declining habitats Deep-sea sponge aggregations and coral gardens are both known to occur in the site (Figure B1).

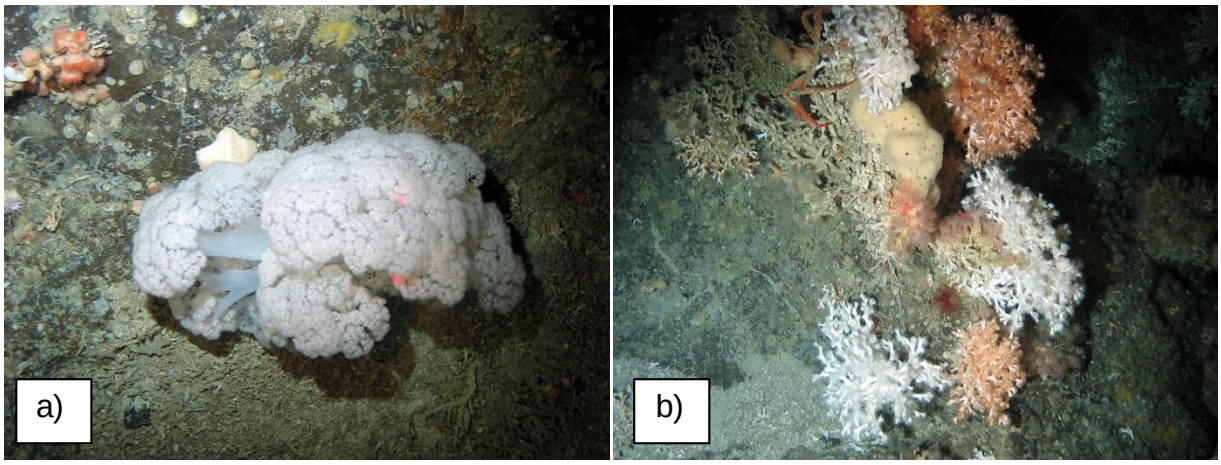


Figure B1: Feature images from East Rockall Bank SAC, showing a) soft coral (*Nephtheidae*) on rock with sponges (*Porifera*) and sea anemones (*Anthozoa*), and b) live cold water coral (*Lophelia pertusa*) with sponges and a crab (*Brachyura*) on rock ©NOC.

The area of the SAC is 3,695 km^2 with reef habitat distributed throughout in the proportions in the table B1 below

Table B1: Estimated extent of reef habitat within SAC

Reef type	**Total area of habitat within SAC (km^2)**
Bedrock	312.808
Biogenic	2.582
Stony	313.848
Total	**629.238**

17.3 The site boundary

The boundary for the East Rockall Bank SAC was defined using the JNCC marine SAC boundary definition guidelines (JNCC, 2012a). The Annex I reef habitats are located at depths between 400 m and 600 m on the western side of the site, and between 1000 m and 1200 m on the eastern side. A buffer of 2 times water depth was applied ranging from 800m at the shallowest part, to 2400m at the deepest part.

17.4 Conservation objectives

Conservation objectives set out the desired quality of the protected features within each Natura 2000 site. The conservation objective for the SCI is, subject to natural change, to restore the reef to favourable condition, such that:

- the natural environmental quality is restored
- the natural environmental processes are maintained; and
- the extent, physical structure, diversity, community structure and typical species representative of bedrock, biogenic and stony reef in the Atlantic North-West Approaches, Rockall Trough and Faroe Shetland Channel Regional Sea are restored.

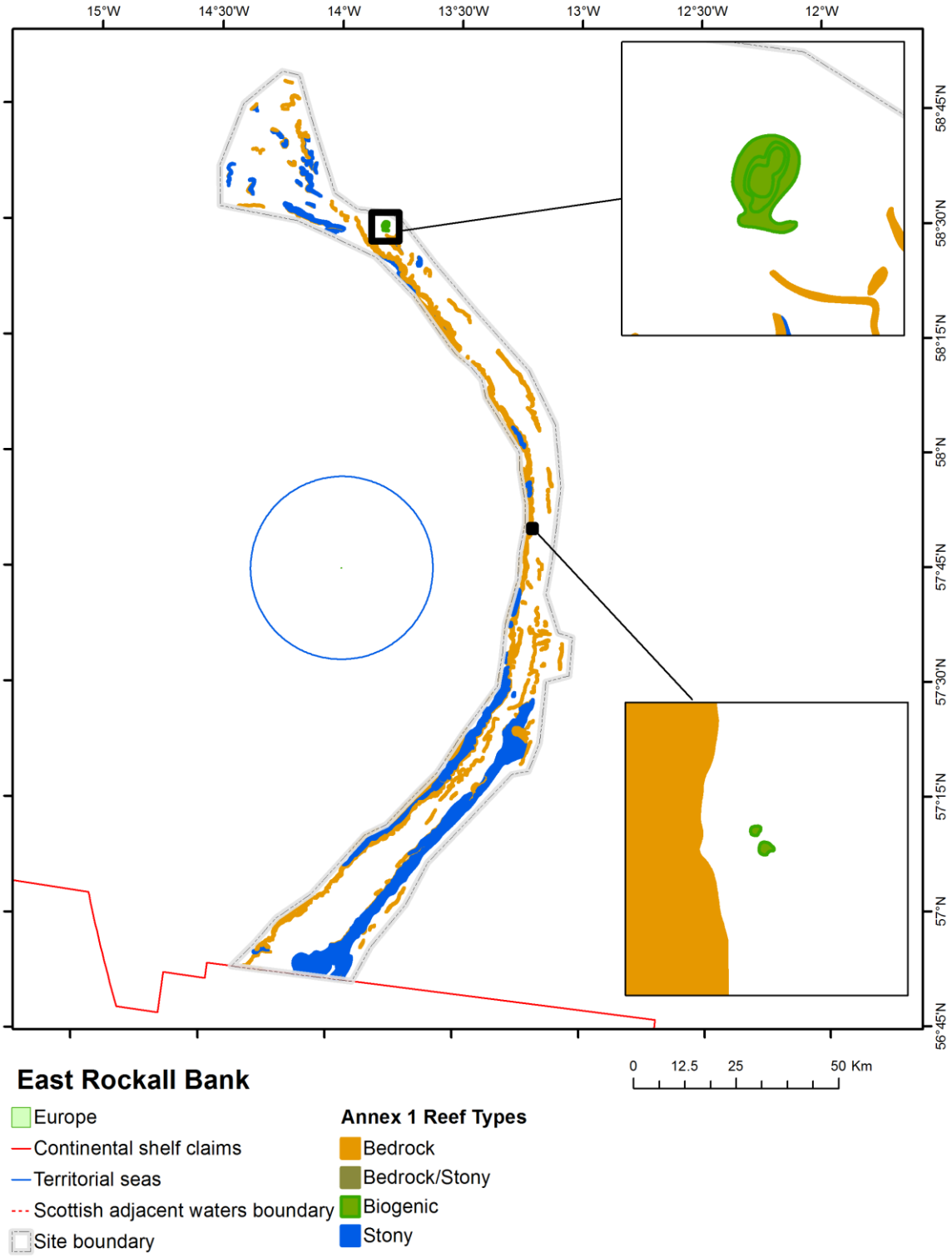


Figure B2: East Rockall Bank SAC site map including distribution of protected features

18 Anthropogenic pressures

18.1 All demersal mobile gear (including dredge, beam trawl, bottom trawl, and seines)

Whilst it is unlikely that demersal towed gears can affect the long-term natural distribution of bedrock and stony reef features, there is evidence to indicate that their use can impact the structure and function of the habitat and the long term survival of its associated species.

The use of towed fishing gears is likely to cause damage or death of fragile, erect species, such as sponges and corals (Freese et al., 1999; Løkkeborg, 2005). Other species such as hydroids, anemones, bryozoans, tunicates and echinoderms may also be vulnerable (McConnaughey et al., 2000; Sewell & Hiscock, 2005). Where fragile, slow growing species occur, even low levels of fishing have the potential to change the structure and function of the habitats and may result in the loss of some characteristic species.

Demersal towed gears reduce the long-term natural distribution of cold water coral (biogenic reef) features, as well as impacting the structure and function of the habitat and the long term survival of its associated species. The passage of towed fishing gear may increase mortality of the coral by crushing, burying or wounding corals, increasing susceptibility to infection and epifaunal recruitment that may eventually smother corals (Fosså et al., 2002).

The passing of a heavy trawl reduces the three-dimensional structure of the coral to rubble, decreasing the complexity of the habitat with impacts on the associated community composition (Koslow et al., 2001; Fosså et al., 2002). Indirect impacts on cold water coral reefs from trawling are from increased levels of suspended particles in the water column causing smothering and polyp mortality (Larsson & Purser, 2011). Corals are slow growing so any damage will take many years to repair (ICES, 2010).

18.2 All demersal static gear (including gillnets, trammel nets, long lines, pots and traps)

Mechanical impacts of static gear (e.g. weights and anchors hitting the seabed, hauling gear over seabed, rubbing/entangling effects of ropes) can damage some species (Eno et al.,1996). Other species appear to be resilient to individual fishing operations but the effects of high fishing intensity are unknown (Eno et al., 2001).

Recovery will be slow (Foden et al., 2010) resulting in significant reduction or even loss of characteristic species. The individual impact of a single fishing operation may be slight but cumulative damage may be significant (Eno et al., 2001; Foden et al., 2010).

Static bottom contact gears are likely to reduce the long-term natural distribution of cold water coral (biogenic reef) features, as well as impacting the structure and function of the habitat and the long term survival of its associated species.

Hooks, lines, nets and ropes entangle corals and 'pluck' them during hauling (Grehan et al., 2004; ICES, 2010). Physical damage to the seabed has been observed which may be caused by dragged anchors (Grehan et al., 2004; ICES, 2010). The individual impact of a single fishing operation may be slight but cumulative damage can be significant. Given the slow growth rate of the reefs, they may take centuries to recover from damage, if at all (ICES, 2010).

19 Proposed fisheries management measures

This section provides details of how the measures were determined.

19.1 Options considered for fisheries management

Table B2 provides a summary of the management advice set out against the various options that have been considered.

Table B2: Summary of fisheries management advice

Activity	Management options considered
Demersal towed gears	**No additional management:** The conservation objectives for the biogenic reef feature would not be met under this option. There is a significant risk of not achieving the conservation objectives for the bedrock and stony reef features.
	Reduce/limit pressures: This option would reduce the risk of not achieving the conservation objectives for the reef features. Appropriate management could include exclusion of mobile bottom contact gears over the main areas of bedrock and stony reef and all known areas of biogenic reef, allowing fishing to continue in fishable areas between the features. It is possible that these areas may include some areas where the distribution of reef is unknown or uncertain, and some very small areas of known bedrock and stony reef and there would therefore be a risk of localised damage to the structure and function of reef communities in these areas. The location of areas to be covered by management restrictions would include a buffer zone to reduce any risk of accidental contact with the feature. The location of areas to be covered by management restrictions would be decided in consultation with fishers.
	Remove/avoid pressures: This option would reduce the risk not achieving the conservation objectives for the reef feature within the site boundary to the lowest possible levels. Restrictions would be required for all mobile bottom contact gears within the full extent of the site boundary. The site boundary includes a buffer zone based on a ratio of 2:1 fishing warp length to depth around the known features to reduce any risk of accidental contact with the feature. Small areas of Annex I stony reef on iceberg ploughmarks on the eastern edge of the Rockall Bank summit and to the west of the site boundary were not included within the site boundary as they represent a minimal extent of Annex I stony reef in comparison to

Activity	Management options considered
	that already present within the site boundary, and to reduce the amount of non-Annex I habitat within the site.
Demersal static gears	**No additional management:** The conservation objectives would not be met for biogenic reef. There is a risk of not achieving the conservation objectives for the bedrock and stony reef features.
	Reduce/limit pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature. Appropriate management could include closure of the known extent of the biogenic reef feature within the site. However, a risk of impact with patches of feature not identified during survey would remain. The location of areas to be covered by management restrictions would include a buffer zone to reduce any risk of accidental contact with the feature. The location of areas to be covered by management restrictions would be decided in consultation with fishers.
	Remove/avoid pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature within the site boundary to the lowest possible levels. Restrictions would be required for all static bottom contact gears within the full extent of the site boundary. The site boundary includes a buffer zone based on a ratio of 2:1 fishing warp length to depth around the known features to reduce any risk of accidental contact with the feature. Small areas of Annex I stony reef on iceberg ploughmarks on the eastern edge of the Rockall Bank summit and to the west of the site boundary were not included within the site boundary as they represent a minimal extent of Annex I stony reef in comparison to that already present within the site boundary, and to reduce the amount of non-Annex I habitat within the site**.**

19.2 Proposed management option and rationale

Table B3 provides details of the chosen management approach and further explanation is provided below.

Table B3: Chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Stony, bedrock and biogenic reef (1170)	Demersal mobile gear	Remove / avoid pressure	Prohibit all demersal towed fisheries from 93.7% of the reef habitat.
Biogenic reef (1170)	Demersal static gear	Remove / avoid pressure	Zonal management including prohibition in areas of known/predicted biogenic reef.

Demersal static gears are only prohibited in areas of known or predicted biogenic reef.

A proportion of the area of potential bedrock and stony reef would remain open to demersal towed gears. Additionally, in some areas the management boundary has been drawn closer to the reef feature than the SAC boundary. At the stakeholder workshop it was evident that vessels tow their gear parallel to the reef and therefore it has been decided that gear width may be used as the determining metric rather than water depth / warp length. This is a policy decision and whilst there is an increased risk of exposure it is not considered to be significant in this case.

The amount of reef that will be exposed to continued fishing pressure is very low when compared to the scale of the habitat within this SAC.

Table B4 details the proportion of each reef type that would be protected from demersal mobile gear, and Table B5 does the same for demersal static gear.

Table B4: Extent of reef protected by proposed demersal mobile gear measures

Reef type	Total area of habitat within SCI (km^2)	Area within demersal mobile management zone (km^2)	% reef habitat protected by demersal mobile management zone
Bedrock	312.808	274.205	87.66%
Biogenic	2.582	2.582	100.00%
Stony	313.848	312.838	99.68%
Total	**629.238**	**589.625**	**93.70%**

Table B5: Extent of reef protected by proposed demersal static gear measures

Reef type	Total area of habitat within SCI (km^2)	Area within static management zone (km^2)	% reef habitat protected by demersal static management zone
Bedrock	312.808	0	0.00%
Biogenic	2.582	2.582	100.00%
Stony	313.848	0	0.00%
Total	**629.238**	**2.582**	**0.4%**

20 Measures envisaged for control, enforcement, and compliance

This section describes the measures that are proposed for implementation.

20.1 Vessel Monitoring System

The frequency of data transmissions should remain at least once every 30 minutes.

20.2 Key provisions to include in EC Regulation

Table B6 provides details of the gear types to be prohibited by the measures and Table B7 provides co-ordinates of the area to which the demersal mobile gear measures should be applied. Tables B8 and B9 provide co-ordinates of the areas to which the demersal static gear measures should be applied. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figure B2.

Table B6: Demersal fishing gears to be prohibited

Gear types to be prohibited by the proposed measures	Habitat code	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	1170	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredges		DRB	DRB, DRH
Gillnets and entangling nets		GN, GNC, GND, GNS, GTN, GTR	GEN, GN, GNC, GND, GNS, GTN, GTR
Hooks and lines		LHM, LHP, LL, LLD, LLS, LTL, LX	LHM, LHP, LLS, LLD, LL, LTL, LX
Pots and traps		FIX, FPO	FIX, FPO, FYK

Table B7: Co-ordinates of prohibited area 1 (dredge, beam trawl, bottom trawl, and seines)

Point	Latitude	Longitude
A	58° 23.513' N	014° 24.974' W
B	58° 25.834' N	014° 25.695' W
C	58° 34.516' N	014° 21.974' W
D	58° 39.349' N	014° 13.714' W
E	58° 39.135' N	014° 09.261' W
F	58° 33.236' N	014° 04.172' W

Point	Latitude	Longitude
G	58° 24.447' N	013° 56.057' W
H	58° 22.801' N	013° 50.041' W
I	58° 22.826' N	013° 41.928' W
J	58° 21.957' N	013° 38.275' W
K	58° 17.119' N	013° 28.846' W
L	58° 11.753' N	013° 17.538' W
M	58° 04.702' N	013° 02.028' W
N	57° 58.077' N	012° 53.900' W
O	57° 50.206' N	012° 50.659' W
P	57° 40.655' N	012° 50.436' W
Q	57° 35.897' N	012° 50.853' W
R	57° 30.956' N	012° 46.603' W
S	57° 30.644' N	012° 43.127' W
T	57° 25.548' N	012° 42.788' W
U	57° 24.420' N	012° 48.179' W
V	57° 20.286' N	012° 47.963' W
W	57° 16.379' N	012° 47.760' W
X	57° 12.471' N	012° 49.615' W
Y	57° 11.783' N	012° 53.545' W
Z	56° 58.889' N	013° 10.901' W
AA	56° 53.011' N	013° 14.851' W
AB	56° 46.982' N	013° 21.804' W
AC	56° 45.007' N	013° 23.186' W
AD	56° 43.879' N	013° 23.975' W
AE	56° 42.171' N	013° 25.170' W
AF	56° 42.050' N	013° 51.968' W
AG	56° 45.301' N	013° 48.870' W
AH	56° 49.201' N	013° 44.085' W
AI	56° 53.994' N	013° 34.312' W
AJ	57° 01.452' N	013° 26.772' W
AK	57° 02.664' N	013° 22.194' W
AL	57° 13.822' N	013° 07.152' W
AM	57° 23.040' N	012° 59.656' W
AN	57° 27.579' N	012° 58.112' W
AO	57° 31.325' N	012° 58.984' W
AP	57° 37.426' N	012° 57.314' W
AQ	57° 39.685' N	012° 57.442' W
AR	57° 40.780' N	012° 57.772' W
AS	57° 41.408' N	012° 57.284' W
AT	57° 42.889' N	012° 57.621' W
AU	57° 45.686' N	012° 57.328' W

Point	Latitude	Longitude
AV	57° 48.492' N	012° 58.629' W
AW	57° 49.830' N	012° 59.483' W
AX	57° 53.360' N	012° 59.820' W
AY	57° 54.162' N	013° 01.179' W
AZ	57° 55.464' N	013° 03.029' W
BA	57° 59.038' N	013° 07.598' W
BB	57° 59.077' N	013° 08.547' W
BC	58° 00.757' N	013° 11.288' W
BD	58° 02.730' N	013° 12.771' W
BE	58° 04.263' N	013° 16.604' W
BF	58° 05.146' N	013° 19.205' W
BG	58° 09.083' N	013° 25.770' W
BH	58° 11.077' N	013° 30.647' W
BI	58° 12.423' N	013° 33.023' W
BJ	58° 13.242' N	013° 34.978' W
BK	58° 16.240' N	013° 39.694' W
BL	58° 16.915' N	013° 43.782' W
BM	58° 18.802' N	013° 55.006' W
BN	58° 20.212' N	014° 04.359' W
BO	58° 21.455' N	014° 07.716' W

Table B8: Co-ordinates of prohibited area 2 (gillnets and entangling nets, hooks and longlines, pots and traps)

Point	Latitude	Longitude
BP	57° 44.389' N	012° 56.441' W
BQ	57° 44.389' N	012° 56.156' W
BR	57° 44.121' N	012° 56.153' W
BS	57° 44.115' N	012° 56.441' W

Table B9: Co-ordinates of prohibited area 3 (gillnets and entangling nets, hooks and longlines, pots and traps)

Point	Latitude	Longitude
BT	58° 21.875' N	013° 43.313' W
BU	58° 21.875' N	013° 41.288' W
BV	58° 20.341' N	013° 41.279' W
BW	58° 20.358' N	013° 43.340' W

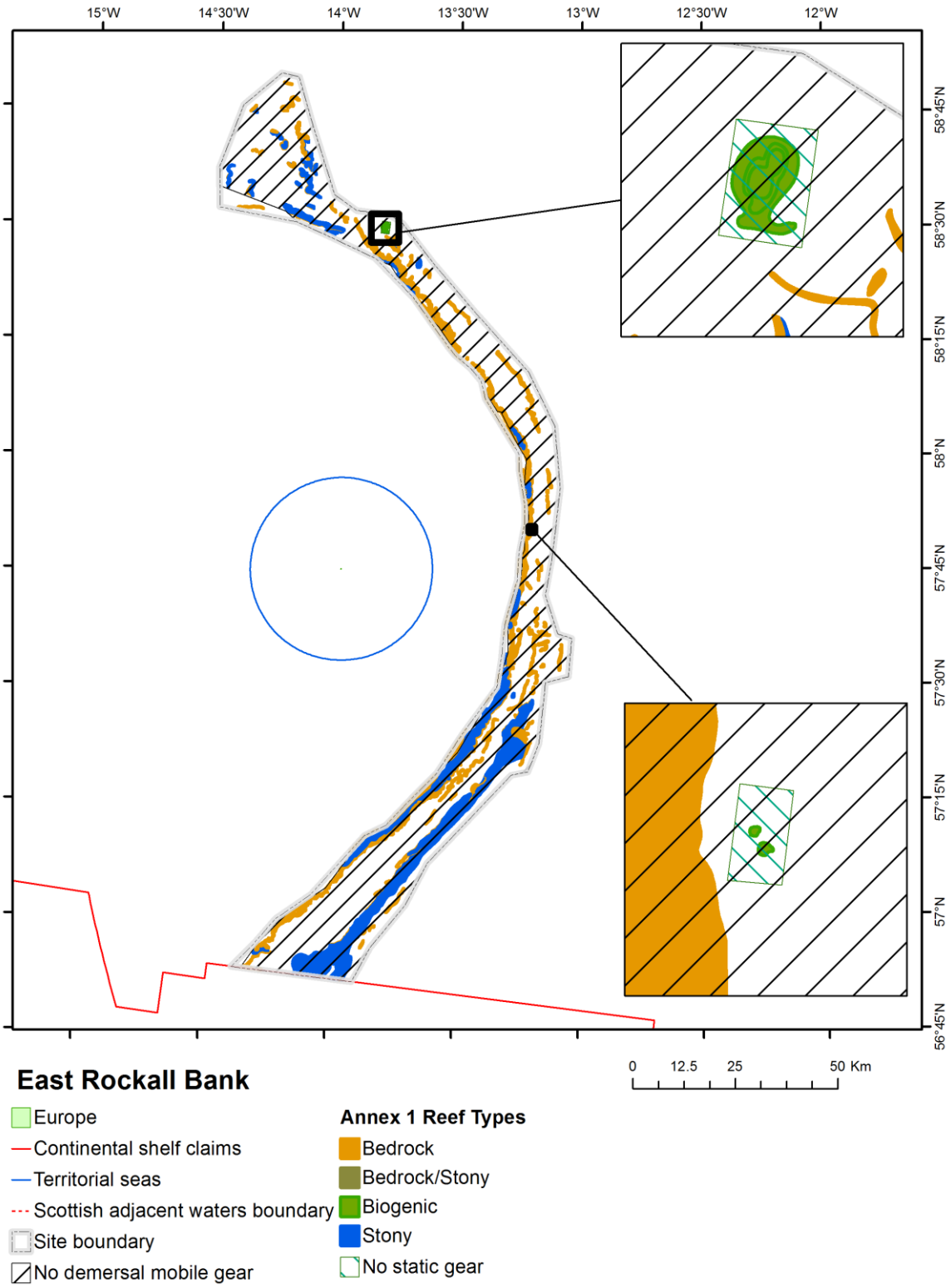


Figure B3: East Rockall Bank SAC with proposed management measures

21 Fleet activity at East Rockall Bank SAC

In this section the potential effect of the measures on fishing effort and value is estimated. These estimates are based on data from 2009 to 2013 using the methodology described in section 9.

21.1 Fishing effort

The management measures for this site apply to all demersal fishing gears with different restrictions for mobile and static gear. Tables B10 to B13 provides average effort estimates for relevant ICES rectangles.

Table B10: Average yearly effort per ICES rectangle relevant to East Rockall Bank SAC using bottom trawl

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
ESP	42D6	17	0	0
IRL	43D6	19	0	0
UK	42D6	293	12	5
UK	43D6	1674	34	23
UK	43D7	10	8	2
UK	44D6	4730	33	8
UK	44D7	167	107	29
UK	45D6	286	101	76

Table B11: Average yearly effort per ICES rectangle relevant to East Rockall Bank SAC using seines

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
IRL	43D6	7	0	0
IRL	44D7	1	0	0

Table B12: Average yearly effort per ICES rectangle relevant to East Rockall Bank SAC using gill nets

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
FRA	42D6	334	244	0
FRA	43D6	95	69	0
FRA	43D7	9	7	0
FRA	44D6	17	3	0
FRA	44D7	26	12	0
FRA	45D5	507	39	0
FRA	45D6	121	48	0
FRA	46D5	61	1	0
IRL	43D7	1	0	0
UK	42D6	210	150	0
UK	43D6	86	45	0
UK	43D7	12	11	0
UK	44D6	110	3	0
UK	44D7	48	36	0
UK	45D5	62	2	0
UK	45D6	56	26	0

Table B13: Average yearly effort per ICES rectangle relevant to East Rockall Bank SAC using long lines

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
DEU	42D6	152	87	0
DEU	43D6	152	125	0
DEU	43D7	23	22	0
DEU	44D6	31	21	0
DEU	44D7	58	42	0
DEU	45D5	202	50	0
DEU	45D6	170	119	0
FRA	42D6	49	36	0
FRA	43D6	79	62	0
FRA	43D7	7	6	0
FRA	44D7	2	2	0
FRA	45D5	35	6	0
FRA	45D6	11	5	0

21.2 Fishing value

Based upon the economic data provided by member states the value of the site, and the value of the management area can be derived. This is done by taking the proportion of the average for the relevant ICES rectangle based upon the amount of effort expended for each gear type in question. Table B14 show the average values derived for the reference period. This is depicted in Figures B4 to B6 through a kernel density estimation of Vessel Monitoring System data.

Table B14: Estimated economic value of mobile gear fisheries at East Rockall Bank SAC(average of 2009 – 2013)[13]

Nation	Gear	Avg annual value in relevant ICES rectangles (Euro)	Avg annual value in SAC (Euro)	Of which avg value affected by management (Euro)
IRL[14]	Bottom trawl	763,361	0	0
FRA	Gill net	1,108,330	442,349	0
DEU	Gill net	248,993	147,247	0
UK	Bottom trawl	5,238,948	274,246	123,019
UK	Gill net	675,643	233,193	0

22 Assessment of potential displacement effects

The total amount of bottom trawl effort that is being displaced (derived from table B10) it is only 2%, or 143 hours out of 7,196 hours effort. Therefore it is concluded that the effort displaced can be absorbed by other fishing grounds in the relevant ICES rectangles.

[13] No economic data received from Spain

[14] Value very high when compared to VMS effort estimate

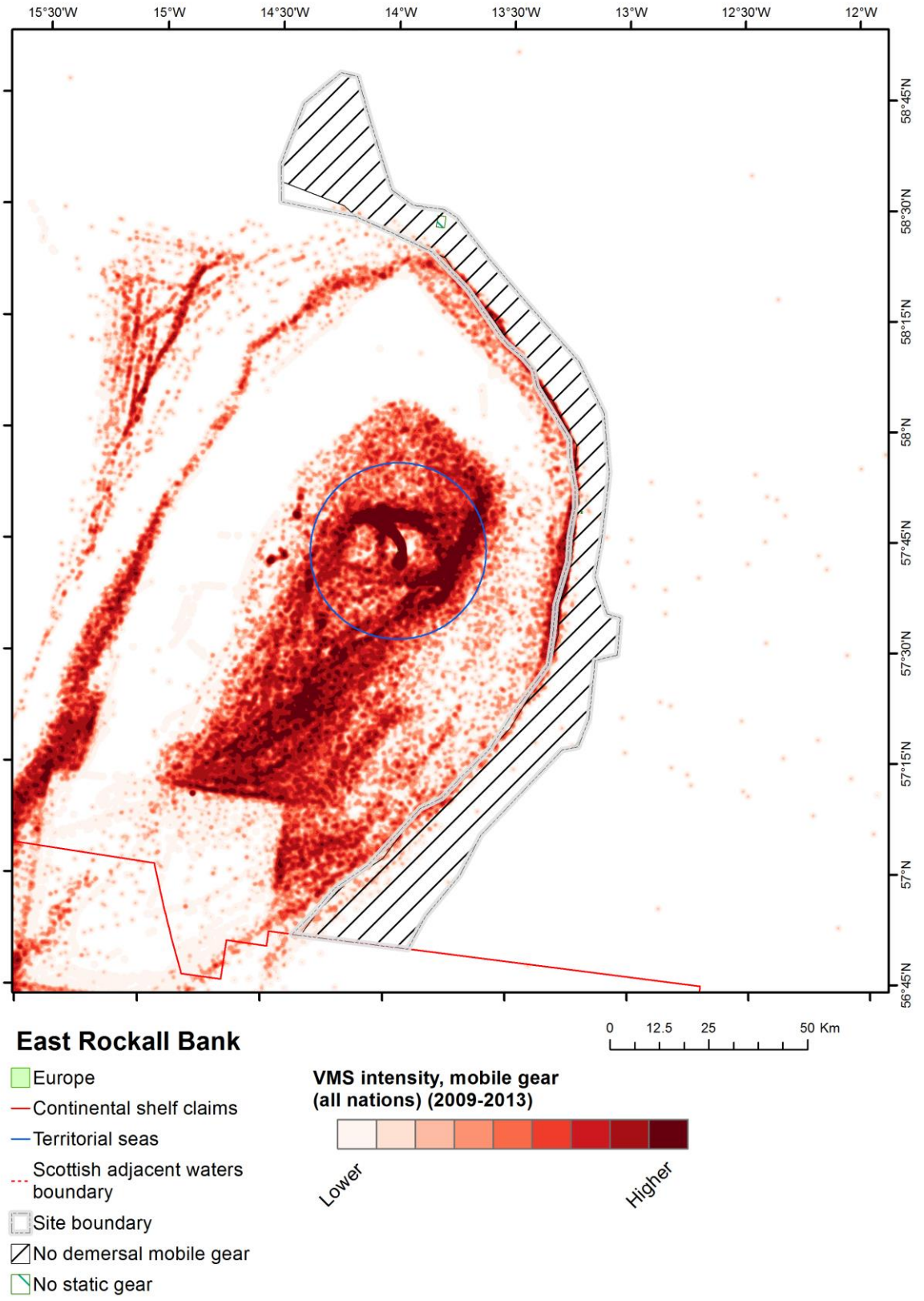


Figure B4: East Rockall Bank SAC map of proposed measures with mobile fishing VMS intensity layer for all vessels 2009-13

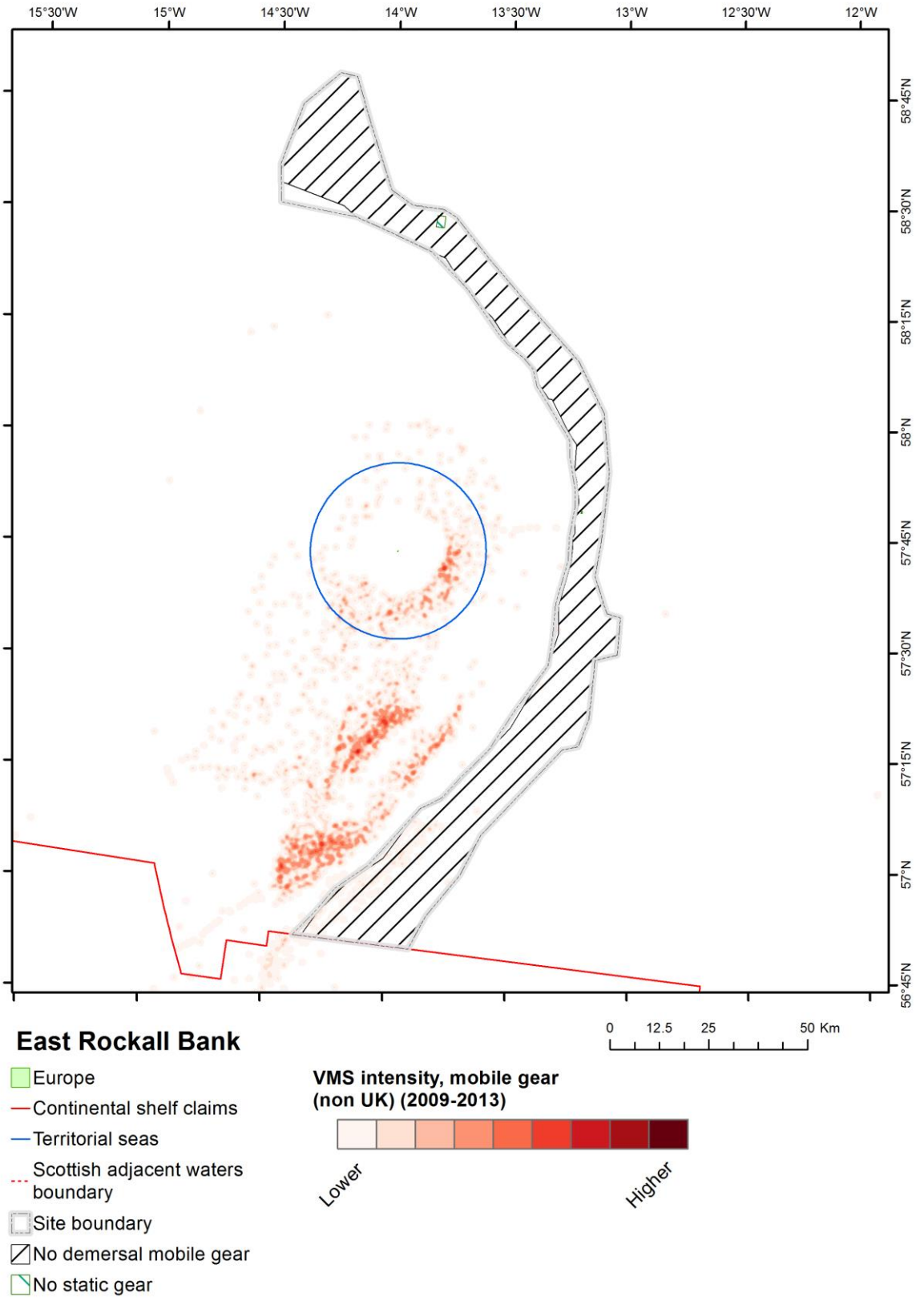


Figure B5: East Rockall Bank SAC map of proposed measures with mobile fishing VMS intensity layer for non-UK European Union vessels 2009-13

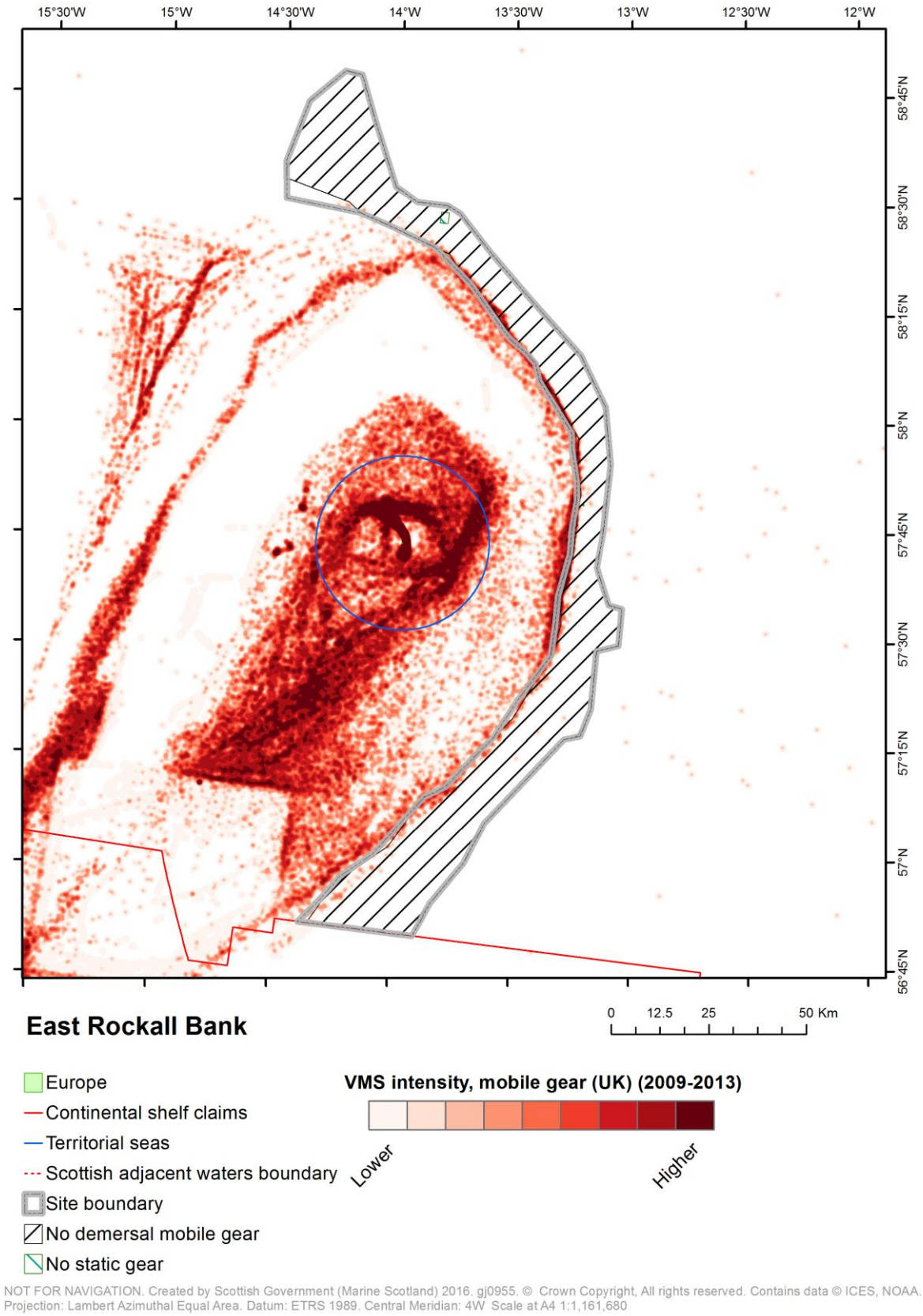


Figure B6: East Rockall Bank SAC map of proposed measures with mobile fishing VMS intensity layer for UK vessels 2009-13

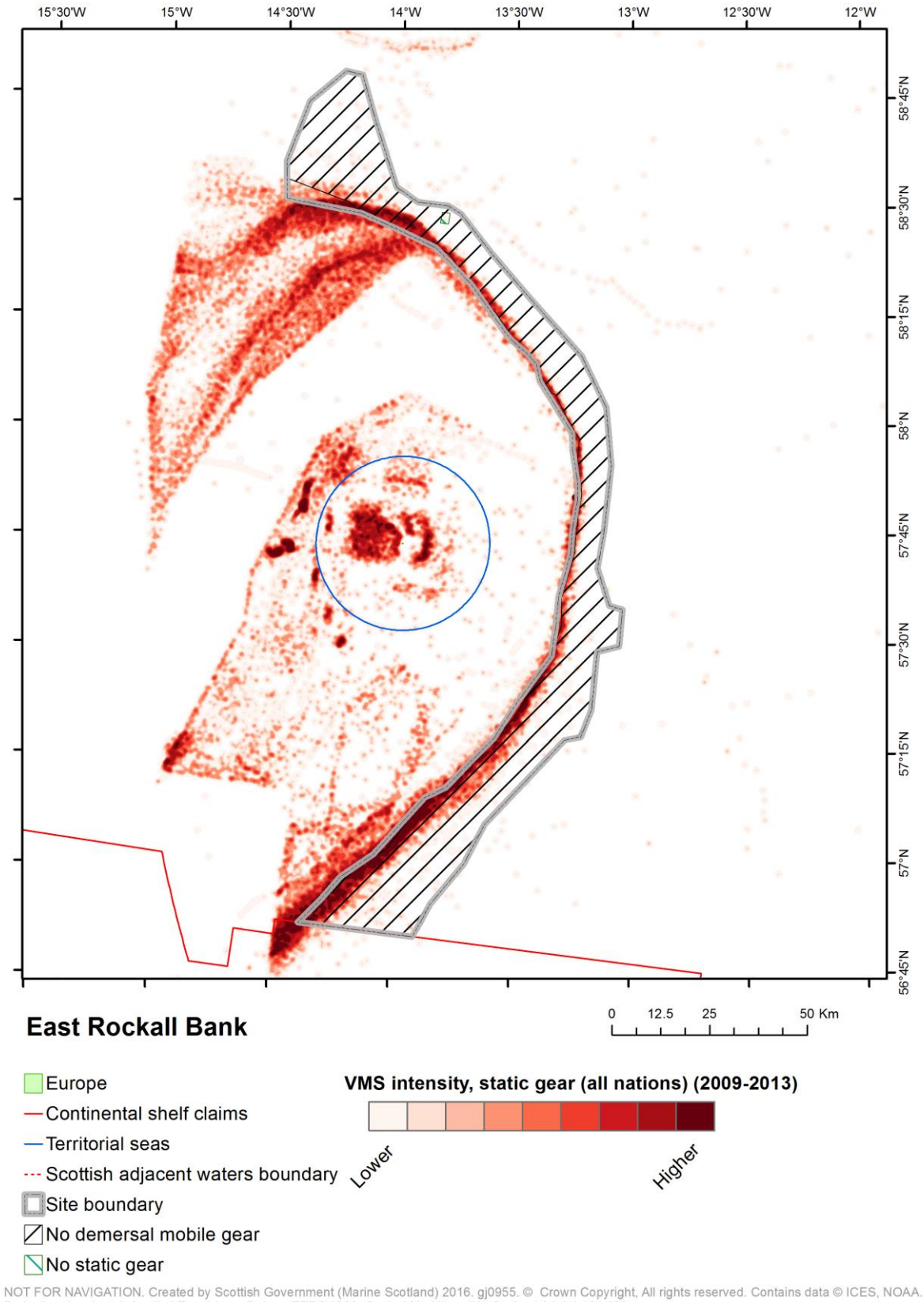


Figure B7: East Rockall Bank SAC map of proposed measures with static fishing VMS intensity layer for all vessels 2009-13

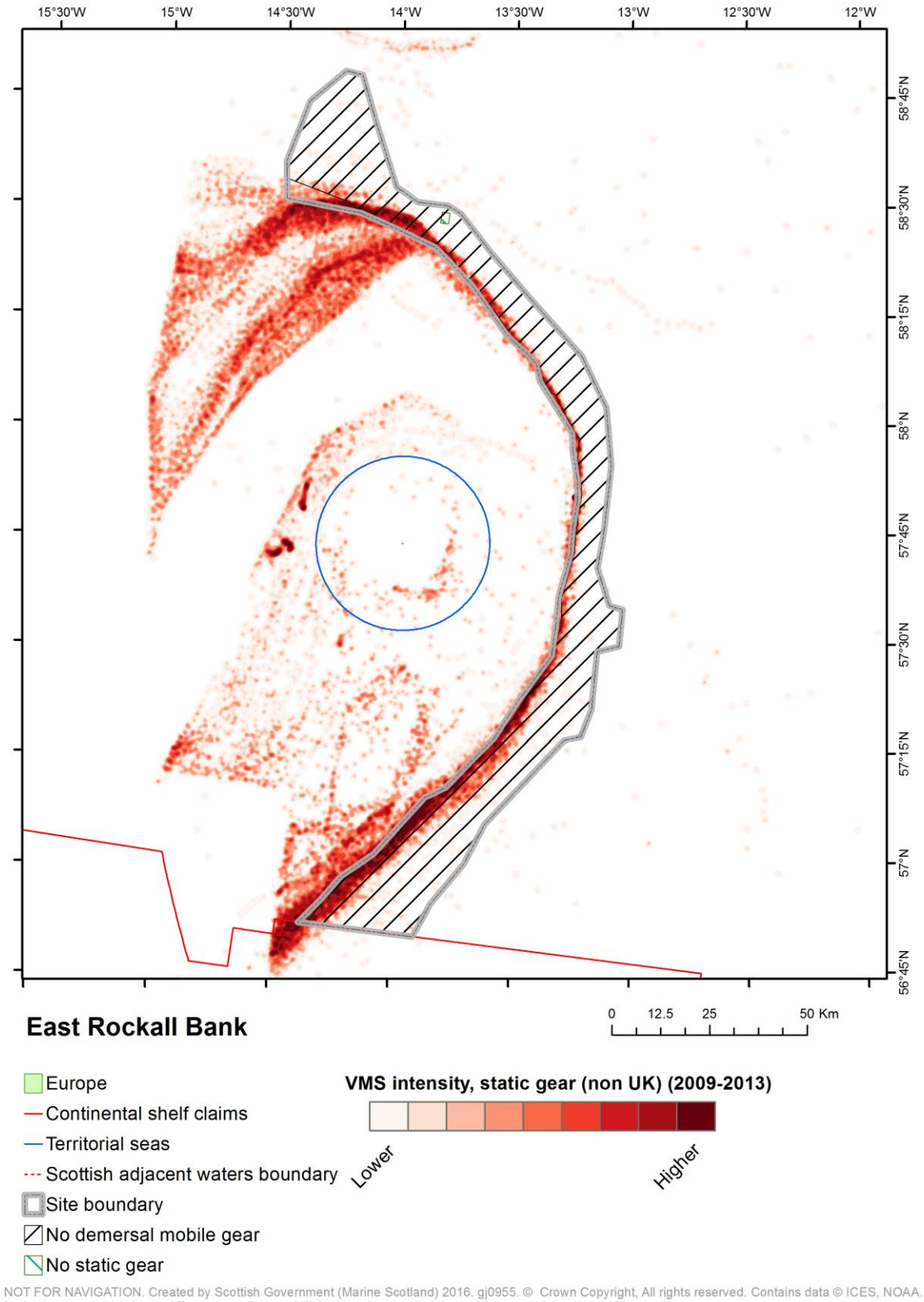


Figure B8: East Rockall Bank SAC map of proposed measures with static fishing VMS intensity layer for non UK European Union vessels 2009-13

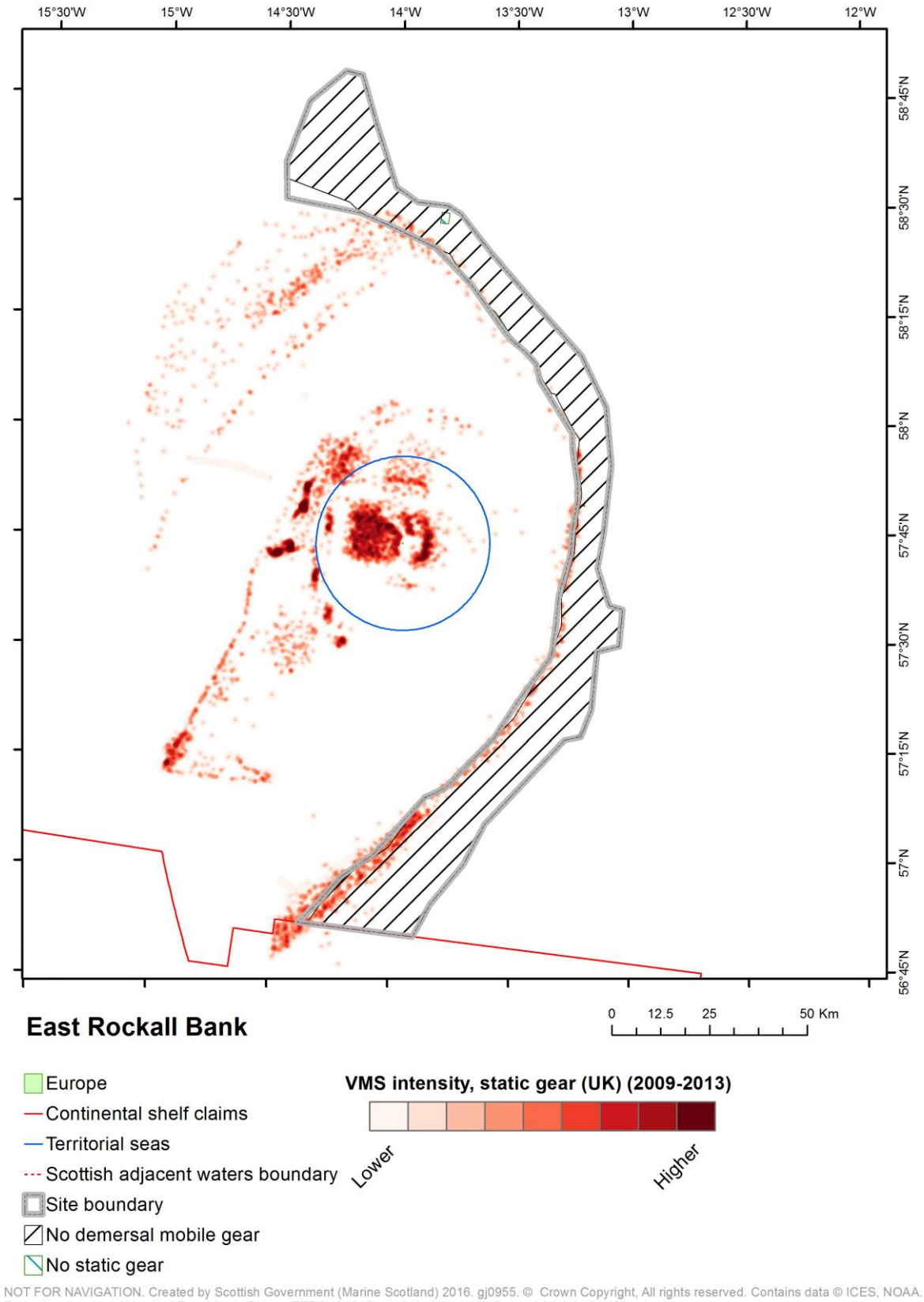


Figure B9: East Rockall Bank SAC map of proposed measures with static fishing VMS intensity layer for UK vessels 2009-13

23 Appropriate Assessment

The management proposal for this site does not provide 100% protection of the reef habitat. Therefore an Appropriate Assessment in accordance with Article 6(3) of the EU Habitats Directive has been undertaken.

23.1 Fishing activity

This is described in this document at section 21 and in figures B3 – B8.

The management proposal is described in sections 19 and 20, with the proposed management measures shown in Figure B2. Tables B4 and B5 provide details of the reef subtypes present with the SAC, and the proportion of each that would be protected by the management measures. In this case 100% biogenic, 99% stony and 87% bedrock reef would be protected.

23.2 Requirements of the EU Habitats Directive

Article 6(3) of the Habitats Directive contains the condition that "Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives"

Continuation of commercial fishing activity potentially overlapping the Annex I feature of the SAC is not be considered necessary to the management of the site. Therefore there is an obligation to apply the Likely Significant Effect test.

23.3 Test of Likely Significant Effect

A review of available sensitivity information was conducted to assess whether the proposed activities are likely to have a significant effect on the Annex I Reef within the East Rockall Bank SAC.

23.3.1 Sensitivity of East Rockall Bank SAC habitats to pressures associated with mobile fishing gear

According to JNCC Conservation Objectives and Advice on Operations (JNCC, 2013), the on-going mobile demersal fishing activities (otter trawling) are associated with the following pressures at East Rockall Bank:

- Physical damage through physical disturbance or abrasion
- Biological disturbance through the selective extraction of species

23.3.2 Sensitivity assessment for East Rockall Bank SAC

JNCC advice on Conservation Objectives and operations provides a generic sensitivity assessment for the features of the East Rockall Bank SAC. This assessment has been drawn principally from MarLIN's evaluation of the following biotope:

'*Lophelia* reefs (SS.SBR.CrI.Lop)'

Three sub-types of Annex I reef are found at the East Rockall Bank site (bedrock, stony and biogenic); the biogenic reef (*Lophelia pertusa*) is the most sensitive of these and JNCC's assessment was based on the L. pertusa biotope.

The JNCC overall sensitivity assessment for the pressures associated with demersal fishing activities is activities is presented below:

Physical damage through physical disturbance or abrasion

Physical abrasion (for example, by mobile fishing gear) can damage the interest feature and its typical species. Physical abrasion is likely to reduce the structural complexity of the feature (for example, by damaging erect epifaunal species such as corals and sponges) and reduce biodiversity through the selective removal of large, sessile, long-lived species from the community (Sewell and Hiscock, 2005). Many of the feature's typical species are permanently attached to the substratum and will not re-attach once displaced. Sensitivity to physical disturbance and abrasion is therefore assessed as high.

Biological disturbance through the selective extraction of species

The selective extraction of species by fisheries can include:

- Removal of target species
- Mortality of non-target species

The biological effects of fisheries can include the removal of target species and the mortality of non-target species. Fish associated with the reefs may be targeted by commercial fisheries. Where this occurs, these effects can lead to shifts in community structure (e.g. if predators are removed from the system) which then lead to indirect effects on the food web as a whole. It is important to note that due to the paucity of evidence on the biological sensitivity of the interest feature, our understanding is likely to evolve over time.

23.3.3 Likely Significant Effect test conclusion

Taking the available sensitivity information into account and the potential impact of mobile demersal gears, it is considered that the proposed operations could have a likely significant effect on the Annex I features of the sites. An Appropriate Assessment of the risks that on-going fishing activities may pose to the features of the sites is presented below.

23.4 Appropriate Assessment of risk to Annex I reef habitat

The site represents Annex I reef, consisting of bedrock, biogenic and stony reef. The eastern edge of the Rockall Bank summit comprises fine sand with iceberg ploughmarks where stony reef of mixed cobbles and pebbles supports erect bryozoans such as *Reteporella* sp., *Munida* sp. (squat lobster), axinellid sponges and encrusting sponges. Historical records (Wilson, 1979a and b) indicate the occurrence of *Lophelia pertusa*, and clumps of *Lophelia pertusa* reef were seen to be associated with coral rubble fringes from data collected on survey in 2005 (Howell et al, 2009).

The eastern flank of Rockall Bank comprises steep slopes between 400 – 750m depth which are composed of mixed substrates of boulders, cobbles and pebbles with areas of exposed bedrock and bedrock outcrop (Howell et al, 2009). A rocky ledge of bedrock reef runs the length of the eastern flank and this supports assemblages of lace corals (stylasterid) and lobose and encrusting sponges (Long et al, 2010). Further down the slope of the eastern flank, the substrate changes to stony reef, composed of boulders and cobbles which support lower abundances of stylasterid corals and higher abundances of sponges.

Live *Lophelia pertusa* biogenic reef was found associated with parasitic cones in the northern region of East Rockall Bank which support a diverse assemblage of antipatharian and gorgonian corals (Long et al, 2010). Further examples of bedrock and biogenic reef and coral rubble were observed in the northern region from a National Oceanography Centre (NOC) survey (Huvenne, 2011)

Physical damage through physical disturbance or abrasion

Rocky habitats can vary in their hardness and therefore resistance to damage from towed demersal gears, however, harder examples of the substrate (e.g. metamorphic rocks) are typically more resistant to damage than softer examples. (e.g. shales and chalk).

Towing fishing gear across rocky substrates is likely to cause damage or death of attached species (Fosså et al., 2000 & 2002; Hall-Spencer et al. 2002; ICES advice 2005-10) and reduce habitat complexity as boulders and cobbles associated with the hard substrate are moved around[3]. Demersal fishing gears break up living and dead biogenic corals resulting in the loss of the physical structure of the reef.

Recovery times for impacted habitat are likely to be longer than for softer sediments and biogenic reefs in particular may take centuries to recover from damage.

The current management proposal for East Rockall Bank SCI ensures the protection from mobile demersal gears of 100% of the mapped biogenic reef feature and 93.7% of the entire Annex I reef resource within the site. As such, the risk to the biogenic reef feature has been removed while the risk to bedrock and stony feature has been reduced.

Biological disturbance through the selective extraction of species

The biological effects of fisheries can include the removal of target species and the mortality of non-target species. However, the reef feature is typically exposed to a low level of selective extraction of species through demersal fishing as trawling effort is concentrated in the wider area surrounding the site.

23.5 Mitigation measures

No additional mitigation measures are being considered in this assessment.

23.6 Conclusion of site integrity test

Marine Scotland consider that the proposed operations would not represent an adverse effect on the site integrity of East Rockall Bank SAC, primarily because;

There is no risk of reduction in reef extent from ongoing fishing activities

There is 100% protection of the biogenic reef habitat.

In 2009 to 2013 the parts of the SAC that would remain exposed to potential mobile gear fishing pressure were only fished for an average of 152 hours per year (derived from Table B10). This is the equivalent of less than 1 week of fishing pressure per year.

Continuation of activities may result in a temporary loss of amenity but it is expected that any effects would be reversible and recovery is likely in the longer term (Kaiser et al. 2006)

24 Geikie Slide and Hebridean Slope Marine Protected Area (MPA)

24.1 Site description

The Geikie Slide and Hebridean Slope MPA is located to the north-west of Scotland and follows the seabed from a depth of 200m on the Hebridean continental shelf into the deep water (>1700m) of the Rockall Trough, as shown in Figures 2 and C1. Habitats within the MPA vary down the slope with the descent into deeper water with a range of Atlantic-influenced sediments. These include deep sea mud and subtidal sand and gravel, including a deep-water variant of the seapens and burrowing megafauna biotope (Figure C2).

The site also includes the geomorphological slide deposit feature representative of The Geikie Slide Key Geodiversity Area (Brooks et al., 2013) as well as a section of the large scale feature the Hebridean continental slope. The MPA covers an area of 2,215km^2 and the protected habitat features are present across most of the site.

24.2 Why the site was designated

All of the protected features of the site are considered to be a priority in terms of marine conservation in Scotland's seas and are considered appropriate for a spatial management approach. Further detail on the processes followed to identify priority marine features in Scottish offshore waters is publically available (JNCC, 2012b).

The MPA encompasses all records of burrows in the area based on data from Marine Scotland Science deep-water towed video surveys. It also includes evidence of seapen by-catch recorded from Marine Scotland Science trawl surveys which is indicative of the OSPAR threatened and declining habitat[15] "Sea-pen and Burrowing Megafauna Communities". The MPA boundary comprises of a corridor down the slope that captures examples of the different biological zones that characterise the Hebridean slope.

More information regarding the site selection process for the Geikie Slide and Hebridean Slope MPA is available in the Detailed assessment against the Scottish MPA Selection Guidelines document.

[15] http://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats

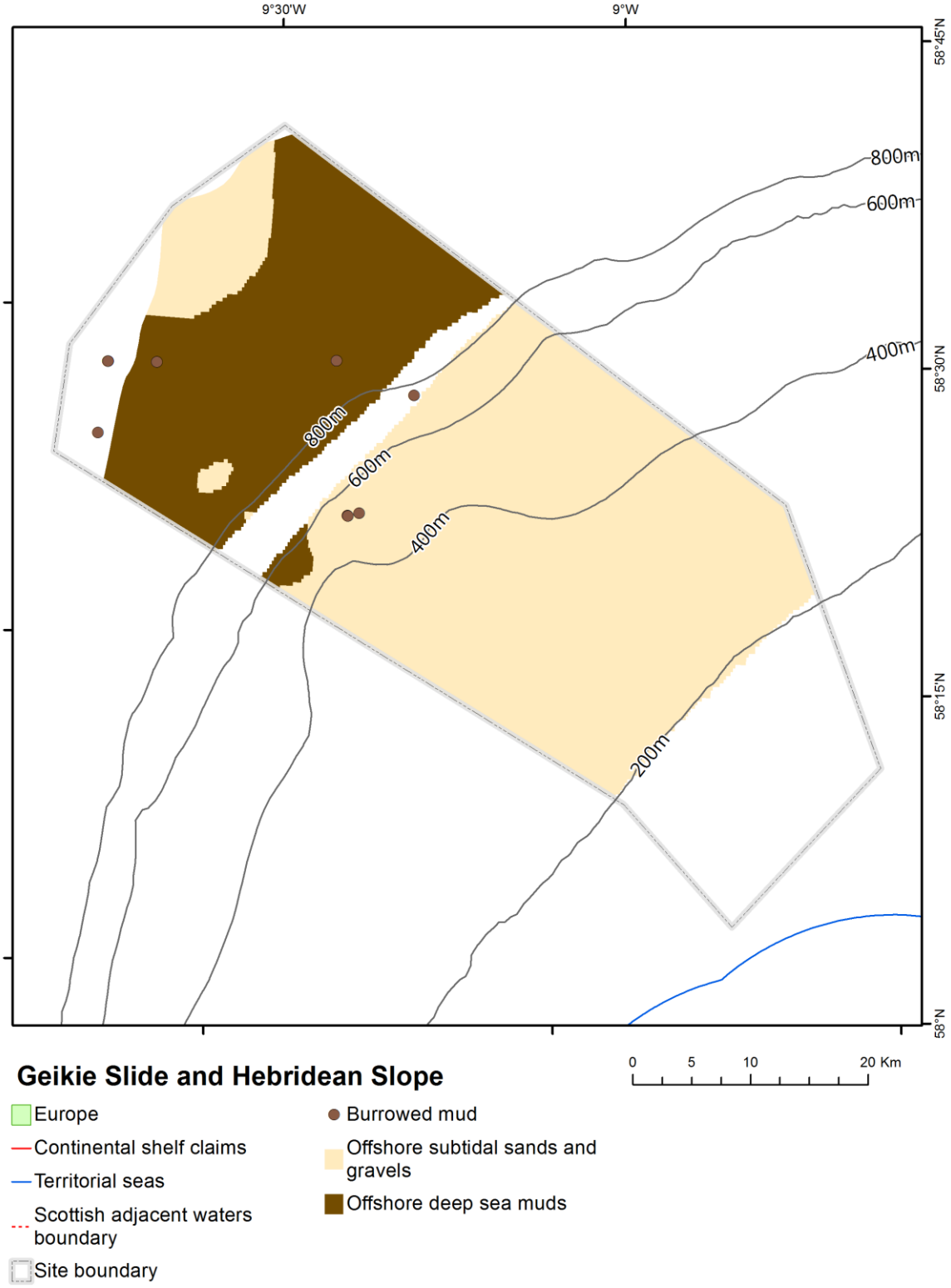


Figure C1: Geikie Slide and Hebridean Slope MPA site map including distribution of protected features

Figure C2: Example images of sands and gravels and muddy sediments taken from Geikie Slide and Hebridean Slope MPA (© JNCC/Marine Scotland Science 2016).

24.3 The site boundary

The boundary was set in accordance with the boundary setting principles outlined in the MPA Selection Guidelines[16]. It focuses on the area of greatest feature data record holdings and was designed to represent all depth strata of the continental slope. This was to provide the best opportunity for representation of the full range of associated biological communities which are reported to vary with depth (Hughes et al., 2014). The boundary also incorporates a submarine landslide feature called the Geikie Slide from which the site takes its name.

Confidence in the presence and extent of the protected features has been set out in the Geikie Slide and Hebridean Slope MPA Data Confidence Assessment.

[16] http://www.scotland.gov.uk/Topics/marine/marine-environment/mpanetwork/mpaguidelines

24.4 Conservation objectives

Subject to natural change, conserve the Burrowed mud, Offshore subtidal sands and gravels, and Offshore deep-sea mud features in favourable condition, such that for each feature:

- its extent is stable or increasing; and
- its structures and functions, its quality, and the composition of its characteristic biological communities are such as to ensure that it is in a condition which is healthy and not deteriorating.

More information regarding the conservation objectives for the protected features of the Geikie Slide and Hebridean Slope MPA is available in the Designation Order.

25 Anthropogenic pressures

25.1 All demersal mobile gears (including dredge, beam trawl, bottom trawl, and seines)

Studies have shown that areas of mud habitats (which include burrowed mud and offshore deep-sea mud) subject to mobile fishing activity support a modified biological community with lower diversity, reduction or loss of long-lived filter-feeding species and increased abundance of opportunistic scavengers (Ball et al., 2000; Tuck et al., 1998). This effect was greatest in the more heavily fished offshore areas suggesting that impact is related to the intensity of fishing (Ball et al., 2000). Furthermore, modelling studies suggest that the greatest impact is produced by the first pass of a trawl (Hiddink et al., 2006).

Where sand and gravel sediments occur in high energy locations (i.e. of wave and/or tide exposed) the associated fauna tend to be well adapted to disturbance and as a result are more tolerant of fishing-related disturbance (Dernie et al., 2003; Hiddink et al., 2006). However, in lower energy deep water locations such as the Barra Fan and the Hebridean Slope, sediments tend to be more stable and their associated fauna less tolerant of disturbance (Hiddink et al., 2006; Kaiser et al., 2006). Stable gravels often support a 'turf' of fragile species which are easily damaged by trawling and recover slowly (Collie et al., 2005; Foden et al., 2010).

Trawling and dredging tends to cause increased mortality of fragile and long lived species and favour opportunistic, disturbance-tolerant species (Eleftheriou & Robertson, 1992; Bergman & van Santbrink, 2000). Some particularly sensitive species may disappear entirely (Bergman & van Santbrink, 2000). The net result is benthic communities modified to varying degrees relative to the un-impacted state (Bergman & van Santbrink, 2000; Kaiser et al., 2006).

25.2 All demersal static gear (including gillnets, trammel nets, long lines, pots and traps)

Features in the Geikie slide and Hebridean Slope MPA are not considered to be sensitive to static gears.

25.3 Other human activities

A small area of the south-western part of the MPA overlaps with a Ministry of Defence practice area. This area is thought to be mostly used for sea surface activity such as vessel transiting and aerial use, and so is unlikely to interact with the protected features of the site. The Ministry of Defence has incorporated all designated MPAs into their Environmental Protection Guidelines (Maritime) and wider Marine Environmental and Sustainability Assessment Tool.

26 Proposed fisheries management measures

This section provides details of how the measures were determined.

26.1 Options considered for fisheries management

Table C1 provides a summary of the management advice set out against the various options that have been considered.

Table C1: Summary of fisheries management advice

Activity	Management options considered
Demersal mobile gear	**No additional management:** There is a risk of not achieving the conservation objectives for burrowed mud, offshore deep sea mud, and offshore subtidal sands and gravels.
	Reduce/limit pressure: This option would reduce, but not entirely eliminate, the risk of not achieving the conservation objectives for burrowed mud, offshore deep sea mud, and offshore subtidal sands and gravels. Appropriate management could include restrictions on fishing with damaging gears over a proportion of each feature's extent, and there may be a greater requirement for restrictions on gears that penetrate deeply into the sediment. The location of areas to be covered by management restrictions would be decided in consultation with fishers. Restrictions could be permanent in some cases or temporary/adaptive in others.
	Remove/avoid pressure: This option would reduce the risk of not achieving the conservation objectives for burrowed mud, offshore deep sea mud, and offshore subtidal sands and gravels to the lowest possible levels.
Demersal static gear	**No additional management**: JNCC consider this option to be sufficient for bottom contacting static gears to achieve the conservation objectives for burrowed mud, offshore deep sea muds, and offshore subtidal sands and gravels.

26.2 Proposed management option and rationale

Table C2 provides details of the chosen management approach and further explanation is provided below.

Table C2: Chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Burrowed mud (seapens and burrowing megafauna)	Demersal mobile gear	Reduce / limit pressure	Zonal restriction to remove pressure from a proportion of each habitat across various depth ranges. No mobile gear fishing below 800m depth.
Offshore subtidal sands and gravels			
Offshore deep-sea muds			

Management measures will be applied to the upper, middle, and lower parts of the slope. This approach is designed to ensure that a proportion of each protected feature is represented across different depth zones. This means that a range of the biological communities present from the upper shelf to the base of the slope will be covered within the management zones.

The remainder of the site will effectively remain as fishing corridors to enable trawling to continue through the MPA on a somewhat restricted basis.

The lower management boundary for demersal mobile gears has been drawn on the 800m contour. Below 800m the collateral damage to vulnerable species exceeds the commercial return from trawl fisheries (Clarke et al., 2015). Therefore, continued trawl activity below that depth would not be considered a sustainable use of the MPA.

26.3 Other fisheries measures which apply to the MPA

It should be noted that the part of this proposal to prohibit trawling in waters greater than 800m depth may be overtaken by the new EU-wide Deep Sea Fisheries Regulation. This is expected to come into force in early 2017.

27 Measures envisaged for control, enforcement and compliance

This section describes the measures that are proposed for implementation.

27.1 Vessel Monitoring System

The frequency of data transmissions shall remain at least once every 120 minutes.

27.2 Key provisions to include in EC Regulation

Table C3 provides details of the gear types to be prohibited by the measures and Tables C4, C5, and C6 provide co-ordinates of the areas to which the measures should be applied. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figure C3.

Table C3: Demersal fishing gears to be prohibited

Gear types to be prohibited by the proposed measures	Habitat / Species	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	Burrowed mud (seapens and burrowing megafauna), offshore subtidal sands and gravels, offshore deep-sea muds	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredges		DRB	DRB, DRH

Table C4: Co-ordinates of prohibited area 1 (dredge, beam trawl, bottom trawl and seines)

Point	Latitude	Longitude
A	58° 23.341' N	009° 46.975' W
B	58° 28.310' N	009° 46.418' W
C	58° 35.033' N	009° 38.450' W
D	58° 39.096' N	009° 29.196' W
E	58° 31.668' N	009° 07.237' W
F	58° 27.828' N	009° 14.511' W
G	58° 27.125' N	009° 18.695' W
H	58° 26.367' N	009° 21.437' W

Table C5: Co-ordinates of prohibited area 2 (dredge, beam trawl, bottom trawl and seines)

Point	Latitude	Longitude
K	58° 17.157' N	009° 24.230' W
L	58° 22.819' N	009° 16.893' W
M	58° 29.396' N	009° 00.594' W
N	58° 27.347' N	008° 54.612' W
O	58° 15.594' N	009° 18.536' W

Table C6: Co-ordinates of prohibited area 3 (dredge, beam trawl, bottom trawl and seines)

Point	Latitude	Longitude
P	58° 09.948' N	008° 58.174' W
Q	58° 18.284' N	008° 38.803' W
R	58° 11.564' N	008° 33.249' W
T	58° 03.855' N	008° 45.156' W
U	58° 09.146' N	008° 55.295' W

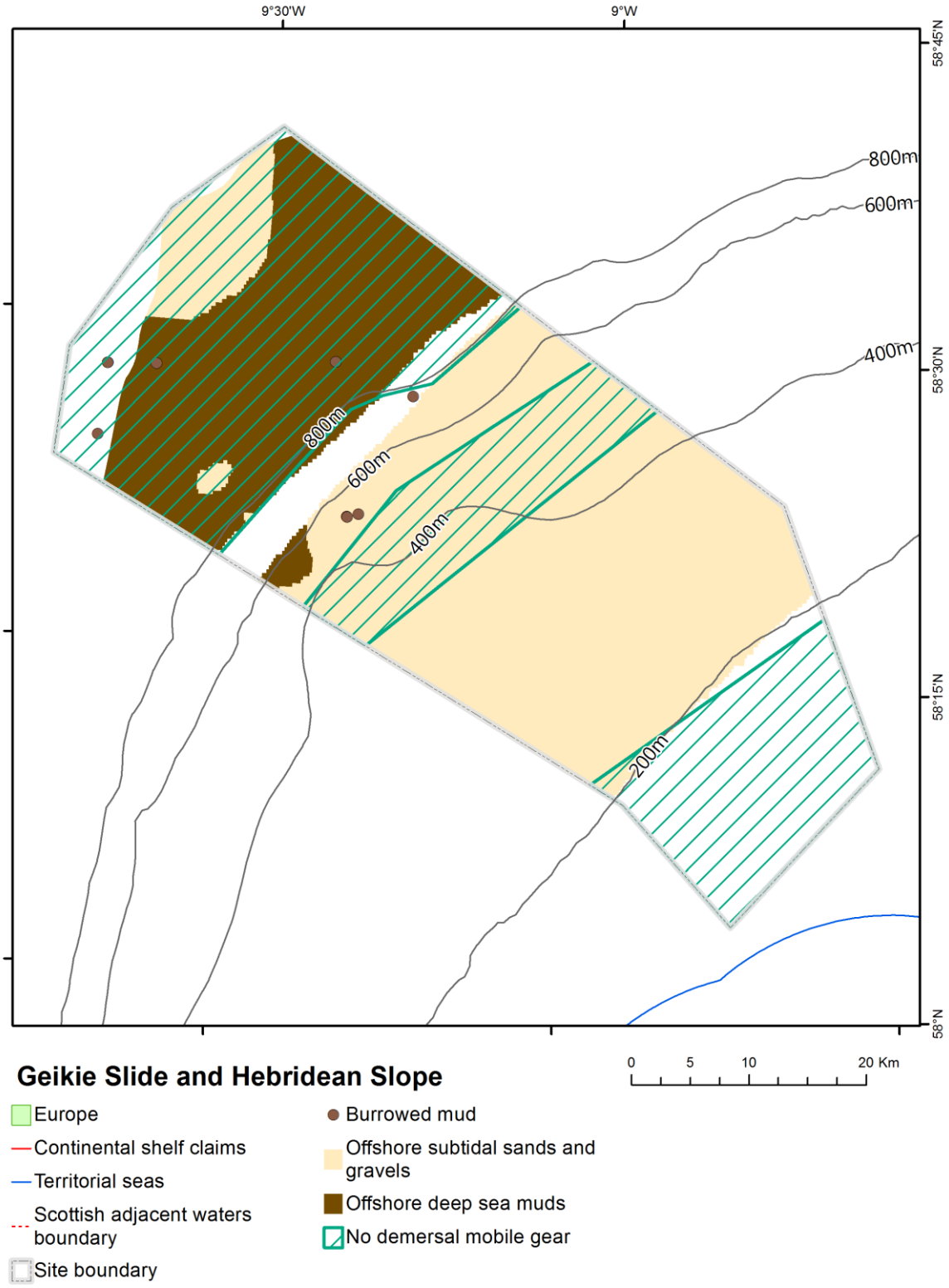


Figure C3: Map of Geikie Slide and Hebridean Slope MPA showing features with proposed management measures

28 Fleet activity at Geikie Slide and Hebridean Slope MPA

In this section the potential effect of the measures on fishing effort is estimated, and then where the amount of effort displaced is greater than 12 hours per year an economic estimate is produced. These estimates are based on data from 2009 to 2013 using the methodology described in section 10.

28.1 Fishing effort

The management measures for this site apply to all demersal mobile gears except seines. Table C7 below amalgamates all bottom trawl effort to produce a yearly average because this was the only method identified as occurring in the reference period. This is depicted in Figures C4 to C6 through a kernel density estimation of Vessel Monitoring System data.

Table C7: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Geikie Slide and Hebridean Slope MPA using bottom trawl

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
DEU	45E0	4	4	1
DEU	45E1	14	6	3
DEU	46E0	2	1	0
ESP	45E0	936	344	94
ESP	45E1	503	234	9
ESP	46E0	2	0	0
FRA	45E0	1639	546	272
FRA	45E1	53	10	0
FRA	46E0	237	100	92
IRL	45E0	4	1	0
IRL	45E1	2	2	0
UK	45E0	651	138	15
UK	45E1	920	386	22
UK	46E0	2	2	0

There is also a significant amount of static gear activity within the MPA. This includes an average of 40 hours gill net and 2505 hours long line effort per year.

28.2 Fishing value

Based upon the economic data provided by member states the value of the site, and the value of the management area can be derived. This is done by taking the proportion of the average for the relevant ICES rectangle based upon the amount of effort expended for each gear type in question. Table C8 show the average values derived for the reference period. This is depicted in Figures C4 to C6 through a kernel density estimation of Vessel Monitoring System data.

Table C8: Estimated economic value of bottom trawl fisheries at Geikie Slide and Hebridean Slope MPA (average of 2009 – 2013)

Nation	gear	Avg annual value in relevant ICES rectangles (Euro)	Avg annual value in MPA (Euro)	Of which avg value affected by management (Euro)
DEU[17]	Bottom trawl	0	0	0
ESP[18]	Bottom trawl	0	0	0
FRA	Bottom trawl	2,195,454	746,614	414,280
IRL	Bottom trawl	3,179	1,590	0
UK	Bottom trawl	1,545,839	565,114	35,783

28.3 Assessment of potential displacement effects

The total amount of displacement can be derived from table C7. This equals an estimated effort of 508 hours, out of a total effort of 4,969 hours in the relevant ICES rectangles. This equates to 10.2% of the total effort. However some of this effort is in waters deeper than 800m, where the new deep sea fishing regulation is expected to prohibit trawl activity. This means a significant proportion of the potential displacement will be caused by implementation of the new EU Deep-Sea regulation. There is also a considerable amount of continental slope fishing grounds to the north and south of the MPA which will remain available to bottom trawlers.

[17] In the data provided by Germany there was no economic data for bottom trawl in this MPA

[18] No economic data provided by Spain

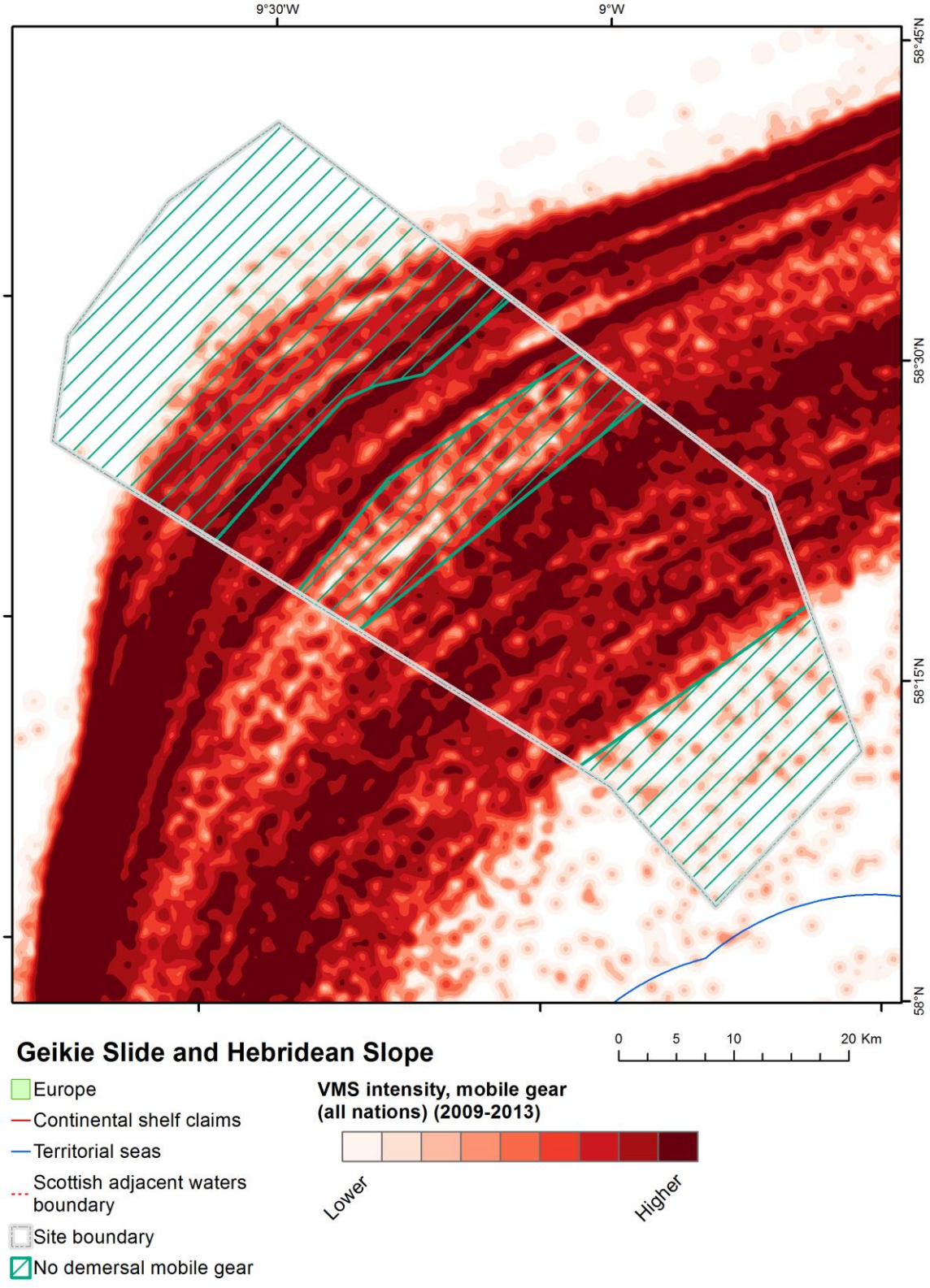


Figure C4: Geikie Slide and Hebridean Slope MPA map of proposed measures with mobile fishing VMS intensity layer for all vessels 2009-13

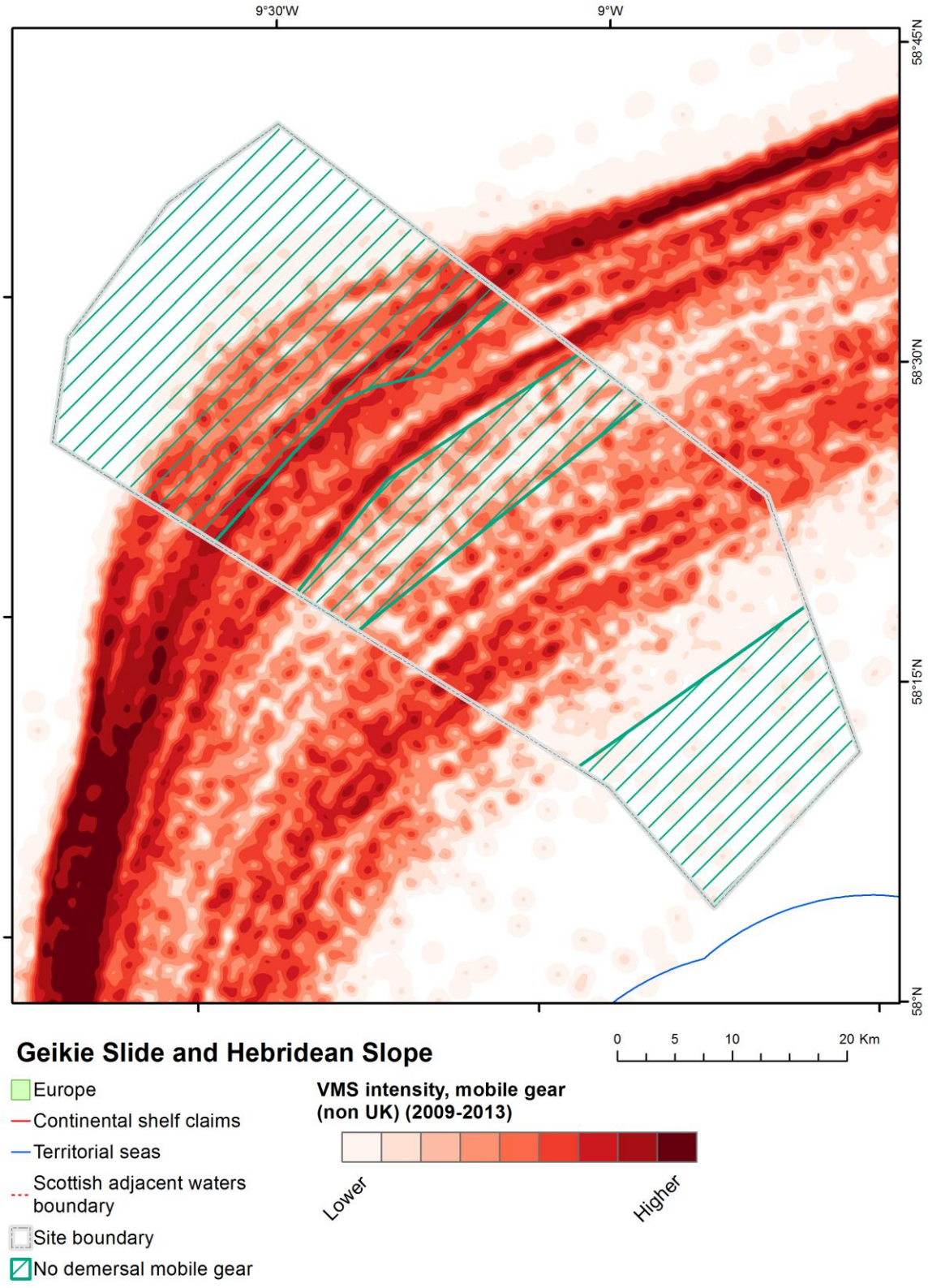


Figure C5: Geikie Slide and Hebridean Slope MPA map of proposed measures with mobile fishing VMS intensity layer for non-UK European Union vessels 2009-13

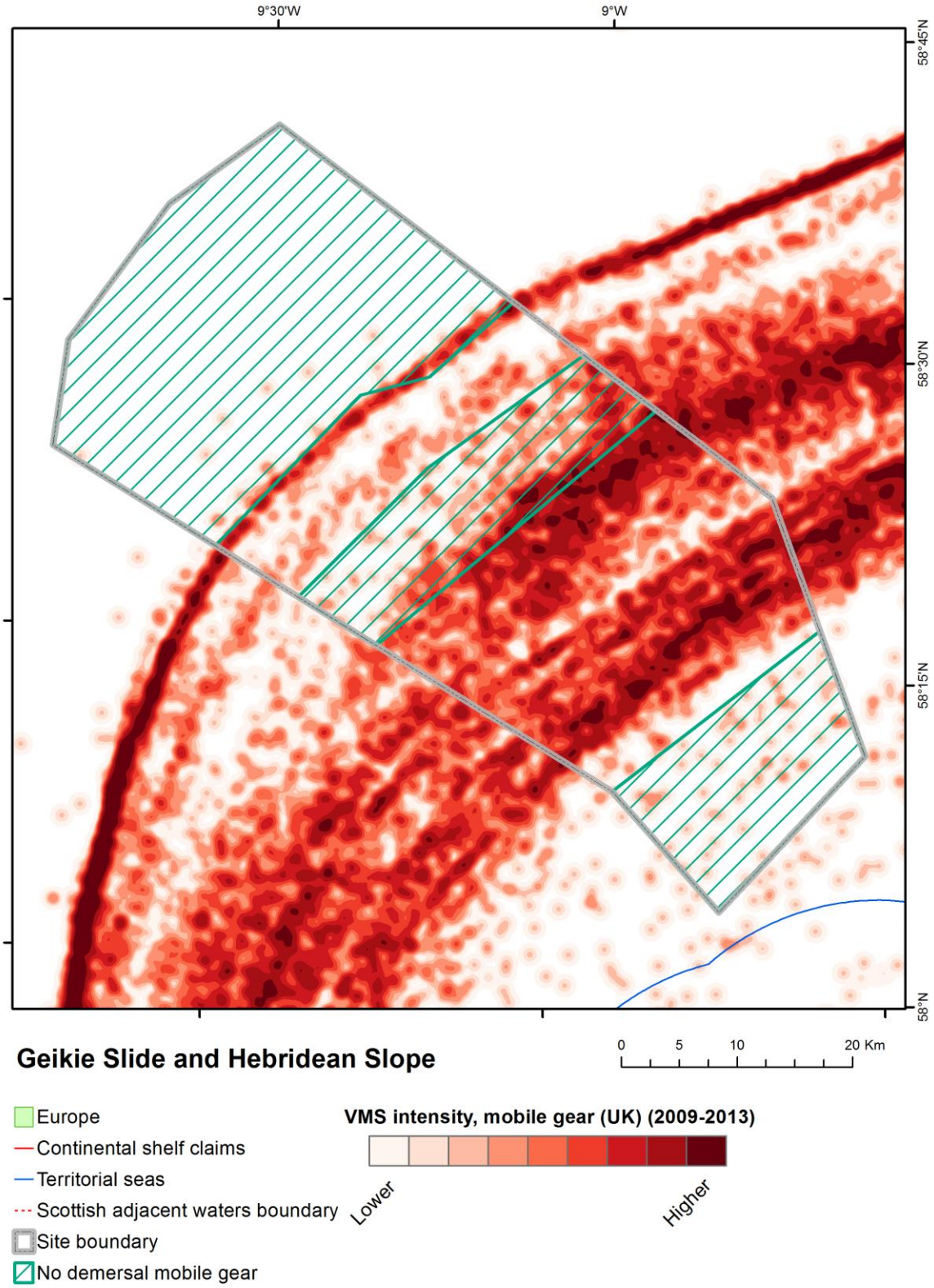


Figure C6: Geikie Slide and Hebridean Slope MPA map of proposed measures with mobile fishing VMS intensity layer for UK vessels 2009-13

Section D

29 Rosemary Bank Seamount Marine Protected Area (MPA)

29.1 Site description

The Rosemary Bank Seamount MPA is located in the deep waters off western Scotland, north-east of the Rockall Trough, as shown in Figures 2 and D2. An extinct volcano, the Rosemary Bank Seamount towers over 1,000 metres above the surrounding seafloor. The MPA ranges in depth from 400m to 2,270m and covers an area of 6,927 km^2.

The seamount provides a hard surface for marine organisms. The physical topography of the seamount affects local currents, thereby affecting the transport of salt and heat across the wider North Atlantic and bringing valuable nutrients to the area. These conditions support rich seamount communities.

Four types of seamount communities are present to varying degrees (reef framework-forming colonial scleractinian corals, soft coral species, deep water sponges and seamount-associated sediments). Reef framework forming corals *Lophelia pertusa* and *Madrepora oculata* occur on Rosemary Bank Seamount and are a significant component of the seamount communities present. Deep-sea sponge aggregations are also a feature of the MPA, comprised of low-lying massive and encrusting fields of yellow, blue, grey and white sponges. Evidence suggests that the dominant species associated with this habitat type are slow growing and may take several decades to reach the sizes which are commonly encountered (Kitgaard & Tendal, 2004).

The high productivity associated with the seamount attracts fish communities such as blue whiting *Micromesistius poutassou* and blue ling *Molva dypterygia* that use the seamount for foraging, breeding and spawning.

29.2 Why the site was designated

All of the protected features of the site are considered to be a priority in terms of marine conservation in Scotland's seas and are considered appropriate for a spatial based management approach. Further detail on the processes followed to identify priority marine features in Scottish offshore waters is publically available (JNCC, 2012b).

Seamounts, deep-sea sponge aggregations and *Lophelia pertusa* reefs are all considered (Figure D1) to be Threatened and/or Declining by the OSPAR Commission. This means this MPA makes a significant contribution to the OSPAR network.

The Rosemary Bank Seamount has functional significance including as a spawning area for commercially important fish (e.g. Blue ling – Large et al., 2010), and as a feeding area for cetaceans (Weir et al., 2001).

More information regarding the site selection process for the Rosemary Bank Seamount MPA is available in the Detailed assessment against the Scottish MPA Selection Guidelines document.

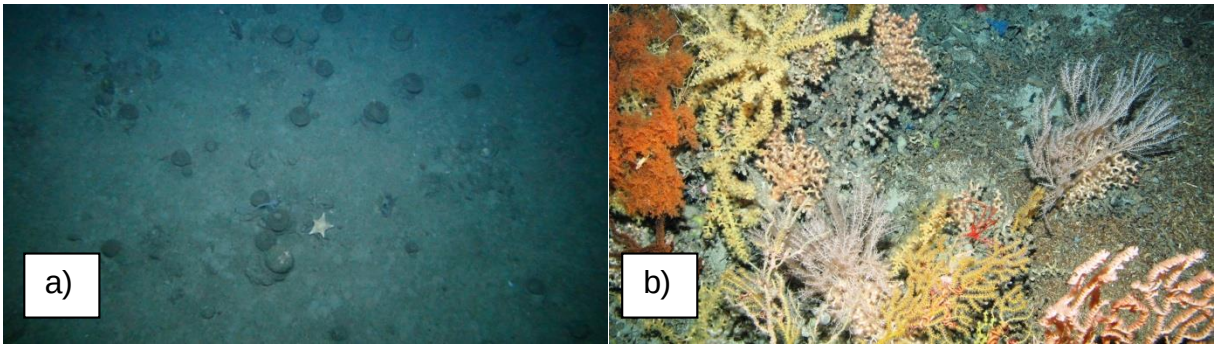


Figure D1: Images representing a) sponge aggregations taken from Rosemary Bank seamount ©MSS and b) a representative image of seamount communities, a feature found at the seamount © JNCC

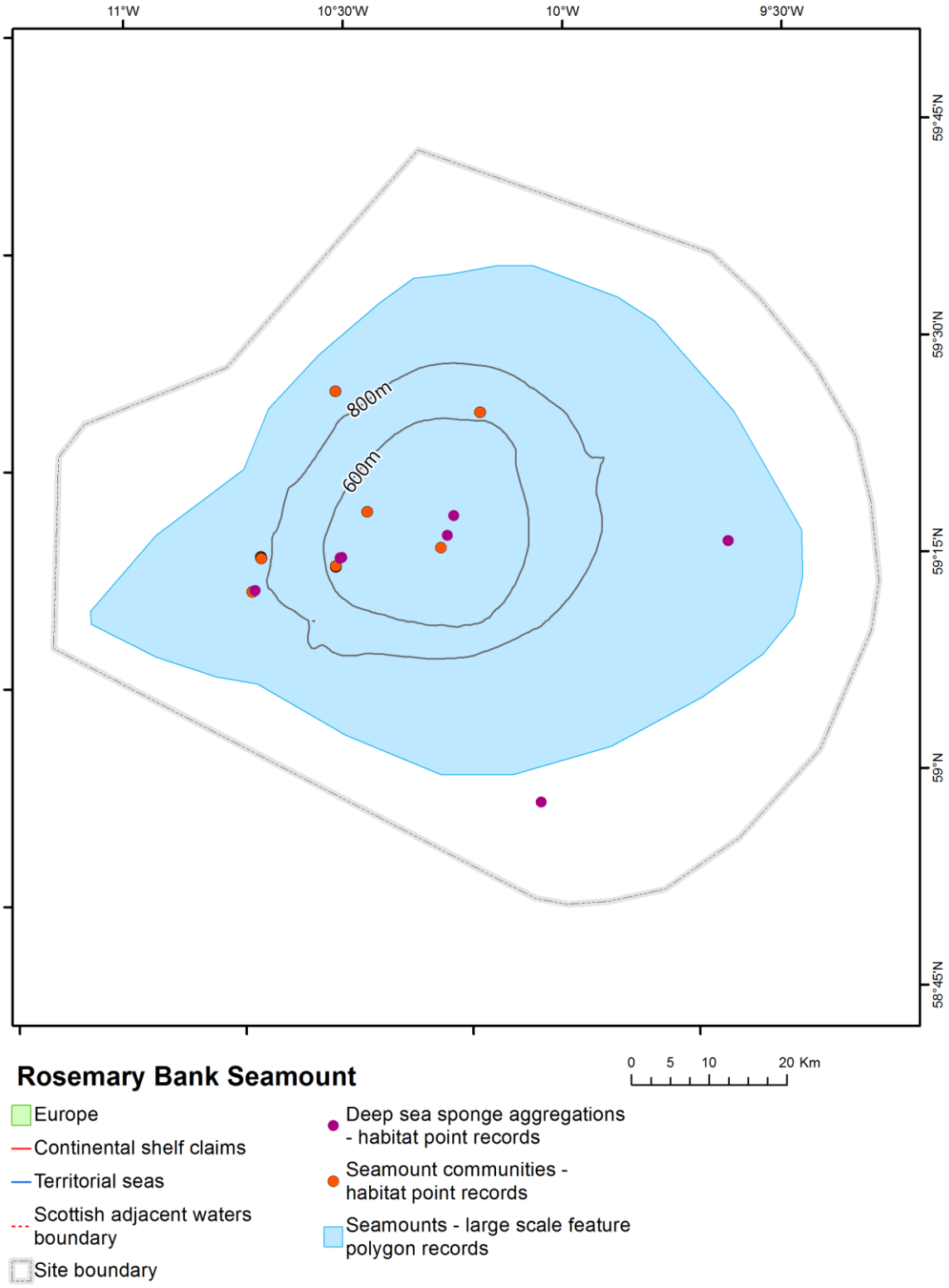


Figure D2: Rosemary Bank Seamount MPA map of site with records of protected features

29.3 The site boundary

The boundary of the Rosemary Bank Seamount MPA has been set in accordance with the boundary setting principles outlined in the MPA Selection Guidelines (Marine Scotland, 2011)[19]. It has been drawn to encompass the known distribution of all deep-sea sponge aggregations and seamount community records, as well as the full extent of the Rosemary Bank Seamount and geodiversity features representative of the Rosemary Bank Seamount Key Geodiversity Area (Brooks et al., 2013).

Confidence in the presence and extent of the protected features has been set out in the Rosemary Bank Seamount MPA Data Confidence Assessment.

29.4 Conservation objectives

Subject to natural change, conserve the deep-sea sponge aggregations and seamount communities features in favourable condition, such that:

- their extent is stable or increasing; and
- their 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.

More information regarding the conservation objectives is available in the Designation Order.

[19] http://www.scotland.gov.uk/Topics/marine/marine-environment/mpanetwork/mpaguidelines

30 Anthropogenic pressures

30.1 All demersal mobile gear (including dredge, beam trawl, bottom trawl, and seines)

The species associated with seamount communities tend to be composed of erect and fragile species that are sensitive to physical disturbance, particularly deep-sea stony corals, gorgonians and black corals, sea anemones, hydroids and sponges (Clark & Tittensor, 2010; Clark et al., 2010). Trawling can cause mortality to species by disturbance on the seabed or by bringing them to the surface resulting in a reduction in abundance (Kaiser et al., 1996; Jennings et al., 2008; ICES, 2010). Recovery from such damage is estimated to be measured in decades, depending on the environmental conditions (Clark et al., 2010; ICES, 2010).

Studies on deep-sea sponge aggregations have found that trawling damages, displaces and removes sponges through direct physical impact, as well as from disturbed sediment resettling and causing smothering beyond the path of the trawl itself (ICES, 2007; OSPAR, 2010; ICES, 2010). Deep-sea sponges have some capacity for recovery from mild damage, but significant disturbance, damage or smothering may result in sponges being unlikely to survive (ICES, 2007; ICES, 2010).

30.2 All demersal static gear (including gillnets, trammel nets, long lines, pots and traps)

No studies providing evidence of the effects of static gears on Scottish seamounts were found, however impacts occurring on analogous vulnerable habitats and species, such as sponges and corals in Scottish waters are applicable (Muñoz et al., 2010). Impacts can arise from hooks, lines, nets and ropes becoming entangled with corals and other fragile species, including 'plucking' them from the seabed during hauling (Mortensen et al., 2005 ; Muñoz et al., 2010; OSPAR, 2010). While the degree of damage from individual fishing operations is likely to be lower than for trawling, cumulative damage may be significant.

The deep-sea sponge aggregation feature is considered to be sensitive to static gear activity, notably because sponges may become caught or entangled in static gears and damaged on the seabed or brought to the surface. Such by-catch by longliners of hexactinellid and demospongid sponges has been documented within the North-east Atlantic (Muñoz et al., 2011) and in the Antarctic (Bowden, 2010).

While the extent of damage caused by individual static gear fishing events is likely to be lower than that for trawling, the effect of cumulative damage may be significant.

31 Proposed fisheries management measures

This section provides details of how the measures were determined.

31.1 Options considered for fisheries management

Table D1 provides a summary of the management advice set out against the various options that have been considered.

Table D1: Summary of fisheries management advice

Activity	Management options considered
Demersal mobile gear	**Remove/avoid pressures:** This is the only option that may allow the conservation objectives for deep-sea sponge aggregations and seamount communities to be achieved. JNCC recommend that this option should be applied across the full extent of the seamount.
Demersal static gear	

31.2 Proposed management option and rationale

Table D2 provides details of the chosen management approach and further explanation is provided below.

Table D2: Chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Seamount communities	Demersal mobile and static gear	Remove / avoid pressure	Prohibition of demersal towed and static gear throughout MPA.
Deep-sea sponge aggregations			

Seamount communities and deep-sea sponge aggregations are classed as vulnerable marine ecosystems. They are considered highly sensitive to all demersal fishing gears. Therefore the only way to remove the risk of deterioration of feature condition would be to prohibit all demersal fishing gears from the MPA.

31.3 Other fisheries measures which apply to the MPA

The current restrictions on gill net activity (EC No 850/98 as amended by EU No 227/2013) mean that this activity is restricted to the top of the seamount where depth is less than 600m. This means that netting effort across the broader MPA is already at a reduced level which makes a contribution to furthering the conservation objectives of the site.

It should be noted that this proposal will be delivered in part by the new EU-wide Deep Sea Fisheries Regulation. This will prohibit trawling in waters greater than 800m and is expected to come into force in early 2017. Historically trawl effort has taken place around this depth contour.

32 Measures envisaged for control, enforcement and compliance

This section describes the measures that are proposed for implementation.

32.1 Vessel Monitoring System

The frequency of data transmissions shall be of at least once every 120 minutes when a vessel is within the MPA, whether in a prohibited or permitted area.

32.2 Key provisions to include in EC Regulation

Table D3 provides details of the gear types to be prohibited by the measures and Table D4 provides co-ordinates of the area to which the measures should be applied. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figure D2.

Table D3: Demersal fishing gears to be prohibited

Gear types to be prohibited by the proposed measures	Habitat / Species	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	Deep-sea sponge aggregations, seamount communities	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredge		DRB	DRB, DRH
Gillnets and entangling nets		GN, GNC, GND, GNS, GTN, GTR	GEN, GN, GNC, GND, GNS, GTN, GTR
Hooks and lines		LHM, LHP, LL, LLD, LLS, LTL, LX	LHM, LHP, LLS, LLD, LL, LTL, LX
Pots and traps		FIX, FPO	FIX, FPO, FYK

Table D4: Co-ordinates of prohibited area (all demersal fishing gears)

Point	Latitude	Longitude
A	59° 34.543' N	009° 37.012' W
B	59° 31.681' N	009° 29.926' W
C	59° 27.267' N	009° 21.644' W
D	59° 22.606' N	009° 15.406' W
E	59° 18.082' N	009° 12.650' W
F	59° 12.747' N	009° 10.836' W
G	59° 09.290' N	009° 11.311' W
H	59° 00.740' N	009° 17.033' W
I	58° 54.194' N	009° 26.881' W
J	58° 50.251' N	009° 36.202' W
K	58° 49.101' N	009° 43.543' W
L	58° 48.689' N	009° 48.870' W
M	58° 48.899' N	009° 53.232' W
N	59° 03.153' N	011° 00.643' W
O	59° 16.362' N	011° 02.700' W
P	59° 18.837' N	010° 59.680' W
Q	59° 23.735' N	010° 41.220' W
R	59° 39.941' N	010° 18.146' W

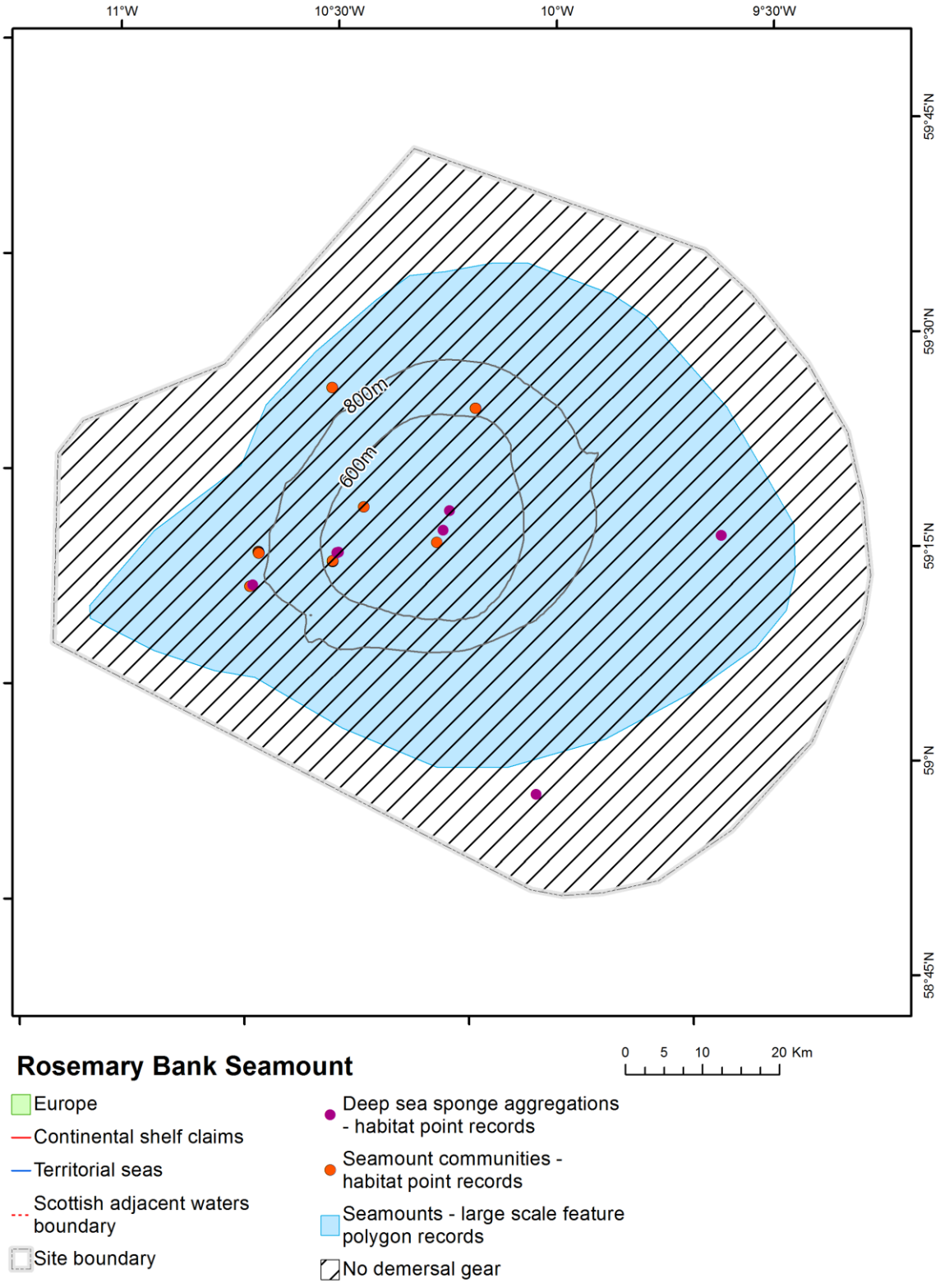


Figure D3: Rosemary Bank Seamount MPA map of proposed measures

33 Fleet activity at Rosemary Bank Seamount MPA

In this section the potential effect of the measures on fishing effort is estimated, and then where the amount of effort displaced is greater than 12 hours per year an economic estimate is produced. These estimates are based on data from 2009 to 2013 using the methodology described in section 9.

33.1 Fishing effort

The management measures for this site apply to all demersal fishing gears. Therefore tables D5 – D9 provides the average effort per relevant ICES rectangle for each gear type

Table D5: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Rosemary Bank Seamount MPA using bottom trawl

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
FRA	47D9	39	39	39
FRA	47E0	41	41	41
FRA	48D9	7	1	1
FRA	48E0	1	0	0

Table D6: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Rosemary Bank Seamount MPA using gill nets

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
DEU	47D9	9	9	9
FRA	46D9	1	0	0
FRA	47D9	25	25	25
FRA	47E0	2	2	2

Table D7: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Rosemary Bank Seamount MPA using long lines

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
DEU	46D9	7	4	4
DEU	46E0	2	2	2
DEU	47D9	510	510	510
DEU	47E0	56	56	56
UK	47D9	2	2	2

Due to lack of access to landings records with information on fishing gear used for non-UK registered vessels the analysis is based on the main gear type on the EU vessel register. It is suspected that the effort that has been identified as being German long lines and pots is actually gill net activity. This is because the landings data provided by Germany shows catches with gill nets from this area.

Table D8: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Rosemary Bank Seamount MPA using pots

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
DEU	47D9	11	11	11

33.2 Fishing value

Based upon the economic data provided by member states the value of the site, and the value of the management area can be derived. This is done by taking the proportion of the average for the relevant ICES rectangle based upon the amount of effort expended for each gear type in question. It has been presumed that the German long line and pots effort is in reality gill net activity.

Table D9 shows the estimated average value of site based upon these proportions. This is depicted in Figures D4 and D5 through a kernel density estimation of Vessel Monitoring System (VMS) data.

Table D9: Estimated economic value of mobile gear fisheries at Rosemary Bank Seamount MPA (average of 2009 – 2013)

Nation	gear	Avg annual value in relevant ICES rectangles (Euro)	Avg annual value in MPA (Euro)	Of which avg value affected by management (Euro)
FRA[20]	bottom trawl	0	0	0
FRA	gillnet	0	0	0
DEU	gillnet	271,535	270,166	270,166

34 Assessment of potential displacement effects

This management proposal will take away one of the areas where gill nets can be legitimately deployed under current EU fisheries regulations. This may cause displacement onto the fishing grounds of the continental slope. Therefore, there is a risk of increased competition and conflict between sectors as there tends to be more trawling on the slope area.

[20] Although activity from France was identified from VMS data, there was no economic data for this MPA

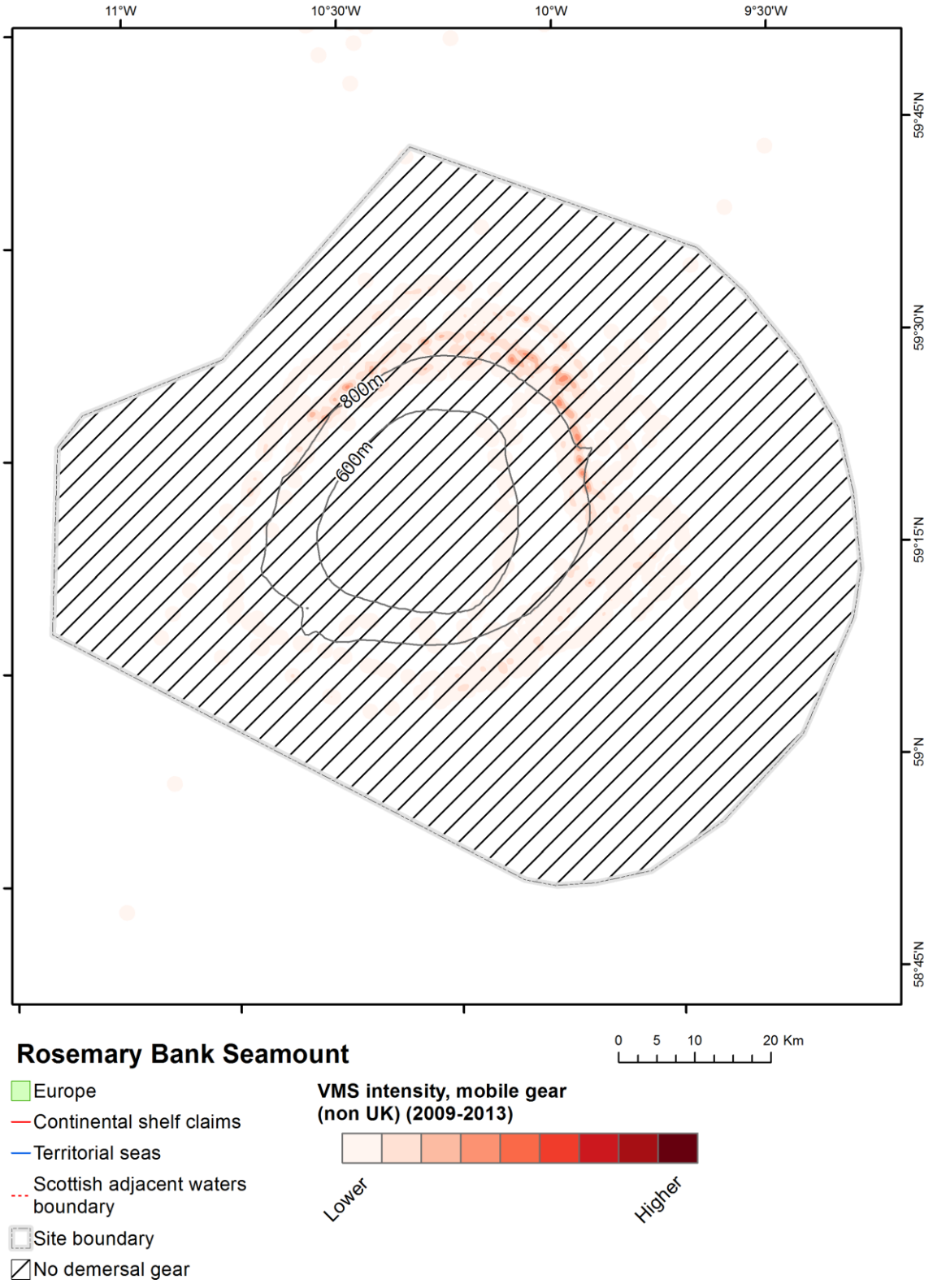


Figure D4: Rosemary Bank map of proposed measures with mobile fishing VMS intensity layer for non-UK European Union vessels 2009-13

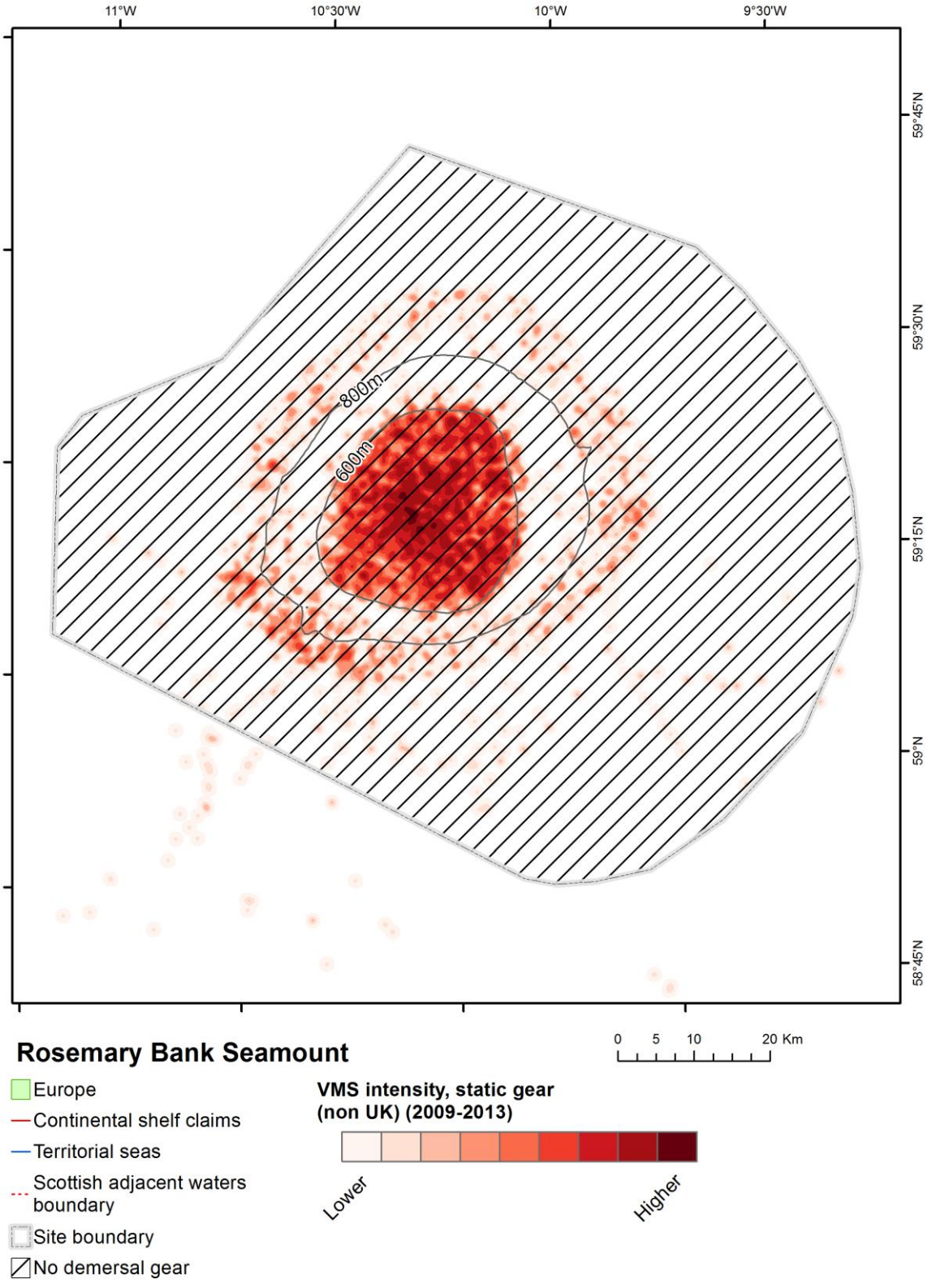


Figure D5: Rosemary Bank map of proposed measures with static fishing VMS intensity layer for non-UK European Union vessels 2009-13

Section E

35 Solan Bank Special Area of Conservation (SAC)

35.1 Site description

Solan Bank Reef SAC is located approximately 50km north of Cape Wrath, as shown in Figures 2 and E1. The reef is located on the Solan Bank High, a Precambrian geological feature of metamorphic basement rock 130km long and 25km wide with sections of sand and clay. The majority of the site lies in water depths of 60-80m; however to the south-east of the site an outcrop of bedrock reef rises to a depth of approximately 20m; while the north of the site extends to around 100m water depth.

In places bedrock outcrops form cliffs of up to 10m in height above the surrounding seabed. Elsewhere the bedrock forms smooth and undulating features known as roches moutonnées (Sugden et al., 1992), created by the scour effect of moving glacial ice. Stony reef comprised of boulders and cobbles with a sandy veneer occurs in ridges to the north-west and south-west of the site; these most likely represent glacial moraine ridges (the tracks of sediment carried by glacial ice) (Whomersley et al., 2010).

The reefs are characterised (Figure E2) by cup corals throughout, and by encrusting bryozoans and coralline algae in the shallower areas. Bittlestars are common on both the bedrock and stony reef. The highly scoured reef is mainly colonised by the keel worm *Pomatoceros triqueter* while a range of sponges, bryozoans and hydroids occur on less scoured reef areas (Whomersley et al., 2010). Water movement created by tidal streams and wave action is greater in shallower areas and here there is a higher abundance of species such as the soft coral *Alcyonium digitatum*, the cup coral *Caryophyllia smithii* and the jewel anemone *Corynactis viridis*. Foliose red algae and kelp grow in the shallowest locations where light penetrates the water.

The full overview of the data used to support site identification along with information on confidence in feature presence and extent is available in the JNCC Solan Bank SCI Site Information Centre.

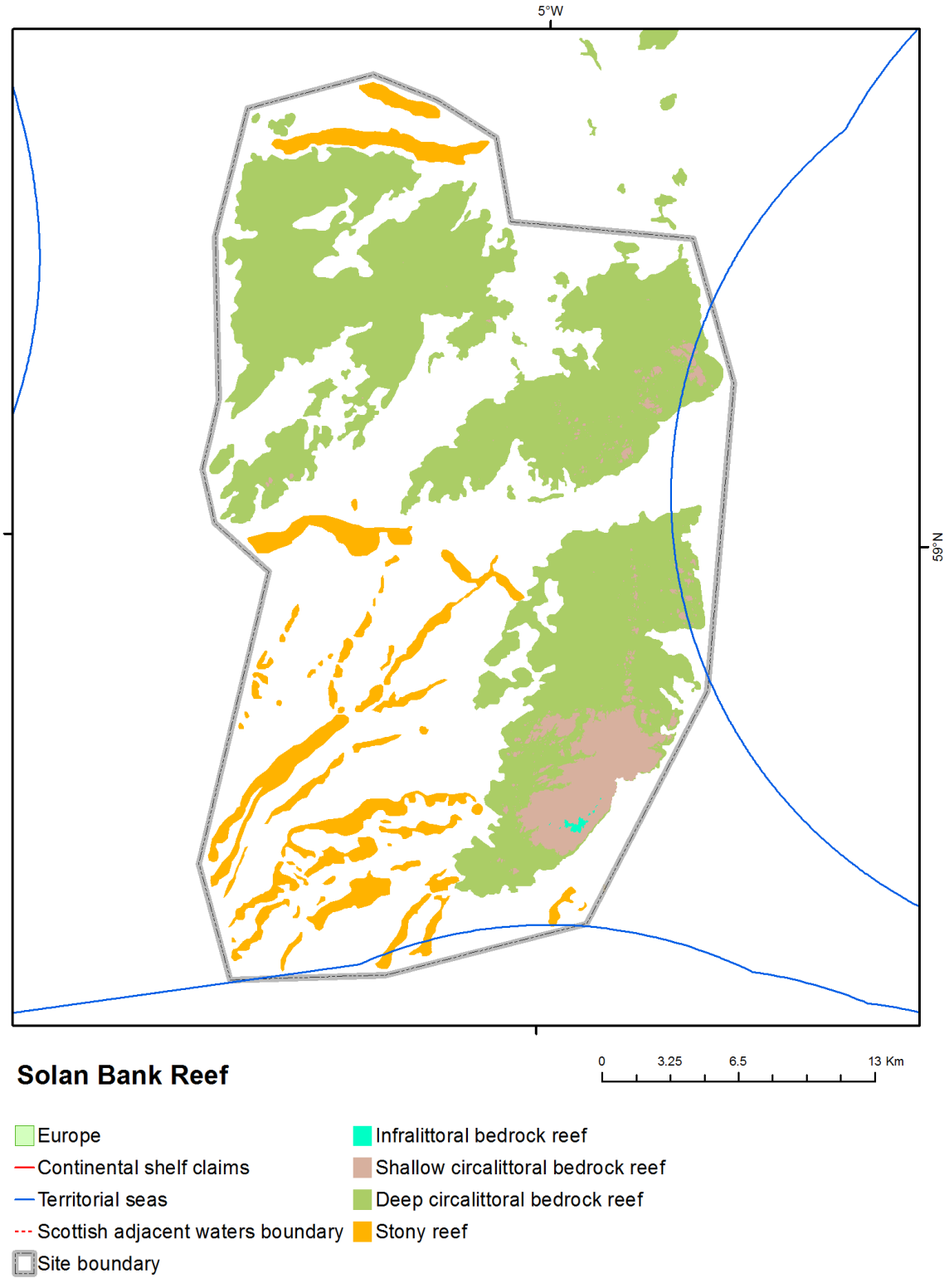


Figure E1: Solan Bank Reef SCI site map including distribution of protected features

35.2 Why the site was designated

Solan Bank Reef is located in the Scottish Continental Shelf Regional Sea. It represents the Annex I reef subtypes hard bedrock reef and stony reef in the infralittoral, circalittoral and deep circalittoral zones. Therefore the site makes a contribution to the Natura 2000 network.

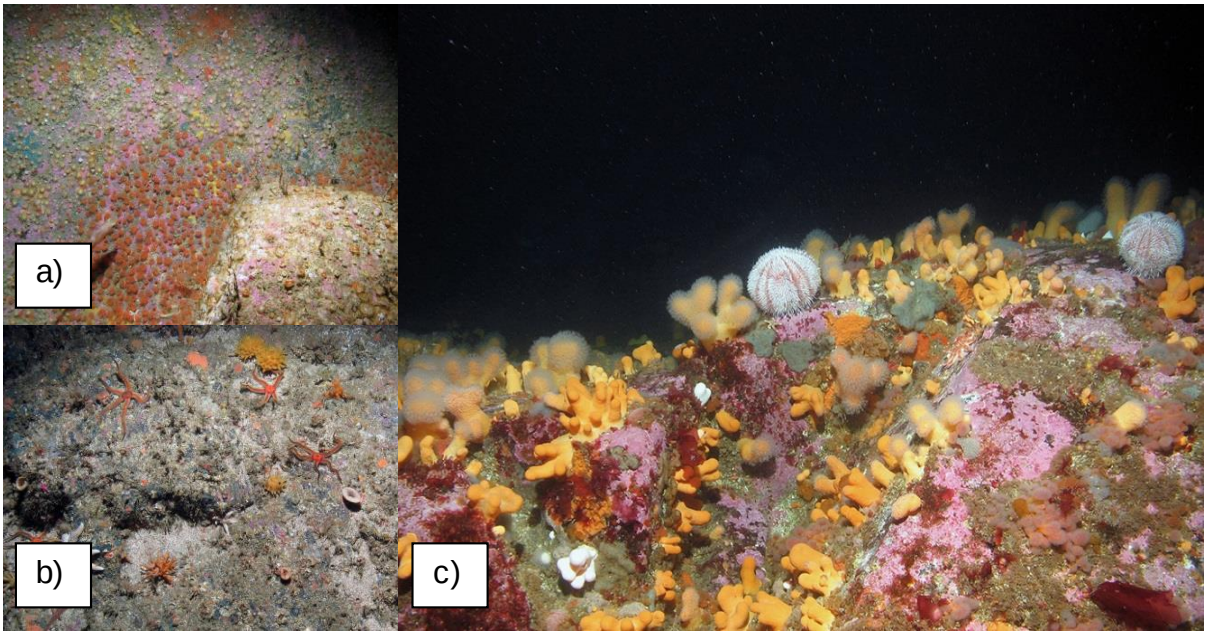


Figure E2: Feature images from Solan Bank SCI showing; a) Jewel anemones (*Corynactis viridis*) and encrusting coralline algae on exposed rock, b) Yellow hedgehog sponge (*Polymastia boletiformis*), black brittlestars (*Ophiocomina nigra*), branching calcareous bryozoa (*Cheilostomatida*) and encrusting sponges on rock with a sand veneer, and c) soft coral (*Alcyonium digitatum*), common sea urchin (*Echinus esculentus*) and encrusting coralline algae on shallow circalittoral bedrock reef © JNCC

35.3 The site boundary

The site boundary for Solan Bank Reef has been defined using the JNCC marine SAC boundary definition guidelines (JNCC, 2012a). The boundary is a relatively simple polygon which includes a 300m buffer, which is 3 times the maximum water depth at the site.

The total area of the SAC is 856Km^2, and consists of the following proportions of reef habitats shown in Table E1, which are spread throughout the site.

Table E1: Estimated extent of reef habitat types within Solan Bank SAC

Reef type	Habitat area within SAC (km^2)
Deep circalittoral bedrock reef	303.326
Infralittoral bedrock reef	0.417
Shallow circalittoral bedrock reef	28.846
Stony reef	60.46
Total	**393.049**

35.4 Conservation objectives

The conservation objective of the Solan Bank SAC is to, subject to natural change, maintain or restore the reef in/to favourable condition, such that:

- the natural environmental quality is restored;
- the natural environmental processes are maintained; and
- the extent, physical structure, diversity, community structure and typical species, representative of reef in the Northern North Sea regional sea are maintained or restored.

36 Anthropogenic pressures

36.1 All demersal mobile gear (including dredge, beam trawl, bottom trawl, and seines)

Whilst it is unlikely that demersal mobile gear can affect the long-term natural distribution of bedrock and stony reef features, there is evidence to indicate that the use of such gears can impact the structure and function of the habitat and the long term survival of its associated species.

The use of towed fishing gears is likely to cause damage or death of fragile, erect species, such as sponges and corals (Freese et al., 1999; Løkkeborg, 2005). Other species such as hydroids, anemones, bryozoans, tunicates and echinoderms may also be vulnerable (McConnaughey et al., 2000, Sewell & Hiscock, 2005).

Where fragile, slow growing species occur, even low levels of fishing have the potential to change the structure and function of the habitats and may result in the loss of some characteristic species.

36.2 All demersal static gear (including gillnets, trammel nets, long lines, pots and traps)

Mechanical impacts of static gear (e.g. weights and anchors hitting the seabed, hauling gear over seabed, rubbing/entangling effects of ropes) can damage some species (Eno et al.,1996). Other species appear to be resilient to individual fishing operations but the effects of high fishing intensity are unknown (Eno et al., 2001). Recovery will be slow (Foden et al., 2010) resulting in significant reduction or even loss of characteristic species. The individual impact of a single fishing operation may be slight but cumulative damage may be significant (Eno et al., 2001; Foden et al., 2010).

37 Proposed fisheries management measures

This section provides details of how the measures were determined.

37.1 Options considered for fisheries management

Table E2 provides a summary of the management advice set out against the various options that have been considered.

Table E2: Summary of fisheries management advice

Activity	Management options considered
Demersal mobile gear	**No additional management:** There is a significant risk of not achieving the conservation objectives for the reef features.
	Reduce/limit pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature. Appropriate management could include exclusion of demersal towed gears over the main areas of bedrock and stony reef, allowing fishing to continue in fishable areas between the features. It is possible that these areas may include some areas where the distribution of reef is unknown or uncertain, and some very small areas of known Annex I reef. There would be a risk of localised damage to the structure and function of reef communities in these areas. The location of areas to be covered by management restrictions could include a buffer zone

Activity	Management options considered
	where relevant, to further reduce any risk of accidental contact with the feature. The location of areas to be covered by management restrictions would be decided in consultation with fishers.
	Remove/avoid pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature within the site boundary to the lowest possible levels. Restrictions would be required for all demersal towed gears within the full extent of the site boundary. The site boundary already includes a buffer zone based on a ratio of 3:1 fishing warp length to depth around the known features to reduce any risk of accidental contact with the feature.
Demersal static gear	**No additional management:** This option is considered to be sufficient for demersal static gear to achieve the conservation objectives for the reef feature. However, if monitoring showed evidence of detrimental effects as a result of static gear activity in the future, additional management may be required.
	Reduce/limit pressures: This option would further reduce the risk of not achieving the conservation objectives for the reef feature. If fishing activity were to rise to levels at which damage was occurring, appropriate management could include partial closure of the feature and/or limits on the amount of gear that can be deployed.

37.2 Proposed management option and rationale

Table E3 provides details of the chosen management approach and further explanation is provided below.

Table E3: Chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Bedrock and stony reef (1170)	Demersal mobile gear	Reduce/limit pressure	Prohibit activity within the Solan Bank Reef SAC on a zonal basis.
	Demersal static gear	No additional management	

The zonal management arrangement is designed to enable limited trawl activity in gaps between the reef habitat. In order to create a coherent fishing zone a small proportion of Annex I reef has been left exposed, as shown in Table E4.

Table E4: Extent of reef protected by management measures

Reef type	Habitat area within SAC (km^2)	Area within mobile gear management zone (km^2)	(%) within mobile gear management zone
Deep circalittoral bedrock reef	303.326	295.083	97.28%
Infralittoral bedrock reef	0.417	0.417	100.00%
Shallow circalittoral bedrock reef	28.846	28.846	100.00%
Stony reef	60.46	48.371	80.00%
Total	**393.049**	**372.717**	**94.83%**

38 Measures envisaged for control, enforcement and compliance

38.1 Vessel Monitoring System

The frequency of data transmissions shall be of at least once every 30 minutes for vessels with demersal mobile gear on board, and they are within the SAC boundary.

38.2 Key provisions to include in EC Regulation

Table E5 provides details of the gear types to be prohibited by the measures and Tables E6, E7 and E8 provides co-ordinates of the area to which the measures should be applied. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figure E3.

Table E5: Demersal fishing gears to be prohibited

Gear types to be prohibited by the proposed measures	Habitat code	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	1170	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredge		DRB , HMD	DRB, DRH

Table E6: Co-ordinates of prohibited area 1 (dredge, beam trawl, bottom trawl and seines)

Point	Latitude	Longitude
A	59° 11.058' N	005° 15.113' W
B	59° 11.986' N	005° 08.863' W
C	59° 11.366' N	005° 05.674' W
D	59° 10.401' N	005° 02.641' W
E	59° 08.239' N	005° 01.852' W
F	59° 05.874' N	005° 01.561' W
G	59° 04.561' N	005° 04.231' W
H	59° 01.503' N	005° 11.230' W
I	59° 00.044' N	005° 15.653' W
J	59° 00.375' N	005° 16.389' W
K	59° 01.742' N	005° 17.033' W
L	59° 03.542' N	005° 16.273' W
M	59° 07.748' N	005° 16.610' W

Table E7: Co-ordinates of prohibited area 2 (dredge, beam trawl, bottom trawl and seines)

Point	Latitude	Longitude
N	59° 01.550' N	005° 07.135' W
O	59° 03.448' N	005° 03.688' W
P	59° 04.403' N	005° 01.239' W
Q	59° 04.841' N	004° 59.867' W
R	59° 06.765' N	005° 00.009' W
S	59° 08.041' N	004° 56.868' W
T	59° 07.878' N	004° 52.748' W
U	59° 04.181' N	004° 50.638' W
V	59° 01.848' N	004° 55.857' W
W	59° 01.184' N	004° 59.030' W
X	59° 01.028' N	005° 00.154' W
Y	59° 00.618' N	005° 07.147' W

Table E8: Co-ordinates of prohibited area 3 (dredge, beam trawl, bottom trawl and seines)

Point	Latitude	Longitude
Z	58° 58.355' N	005° 13.976' W
AA	58° 58.171' N	005° 08.710' W
AB	58° 57.276' N	005° 07.341' W
AC	58° 55.147' N	005° 05.562' W
AD	58° 52.400' N	005° 03.504' W
AE	58° 52.398' N	005° 02.500' W
AF	58° 55.081' N	005° 01.982' W
AG	58° 56.981' N	005° 02.882' W
AH	58° 58.224' N	005° 01.615' W
AI	58° 59.377' N	005° 00.524' W
AJ	59° 00.358' N	004° 58.593' W
AK	59° 00.849' N	004° 55.123' W
AL	59° 01.124' N	004° 51.076' W
AM	58° 56.229' N	004° 51.778' W
AN	58° 50.202' N	004° 57.583' W
AO	58° 48.800' N	005° 07.469' W
AP	58° 48.611' N	005° 15.178' W
AQ	58° 51.588' N	005° 16.840' W

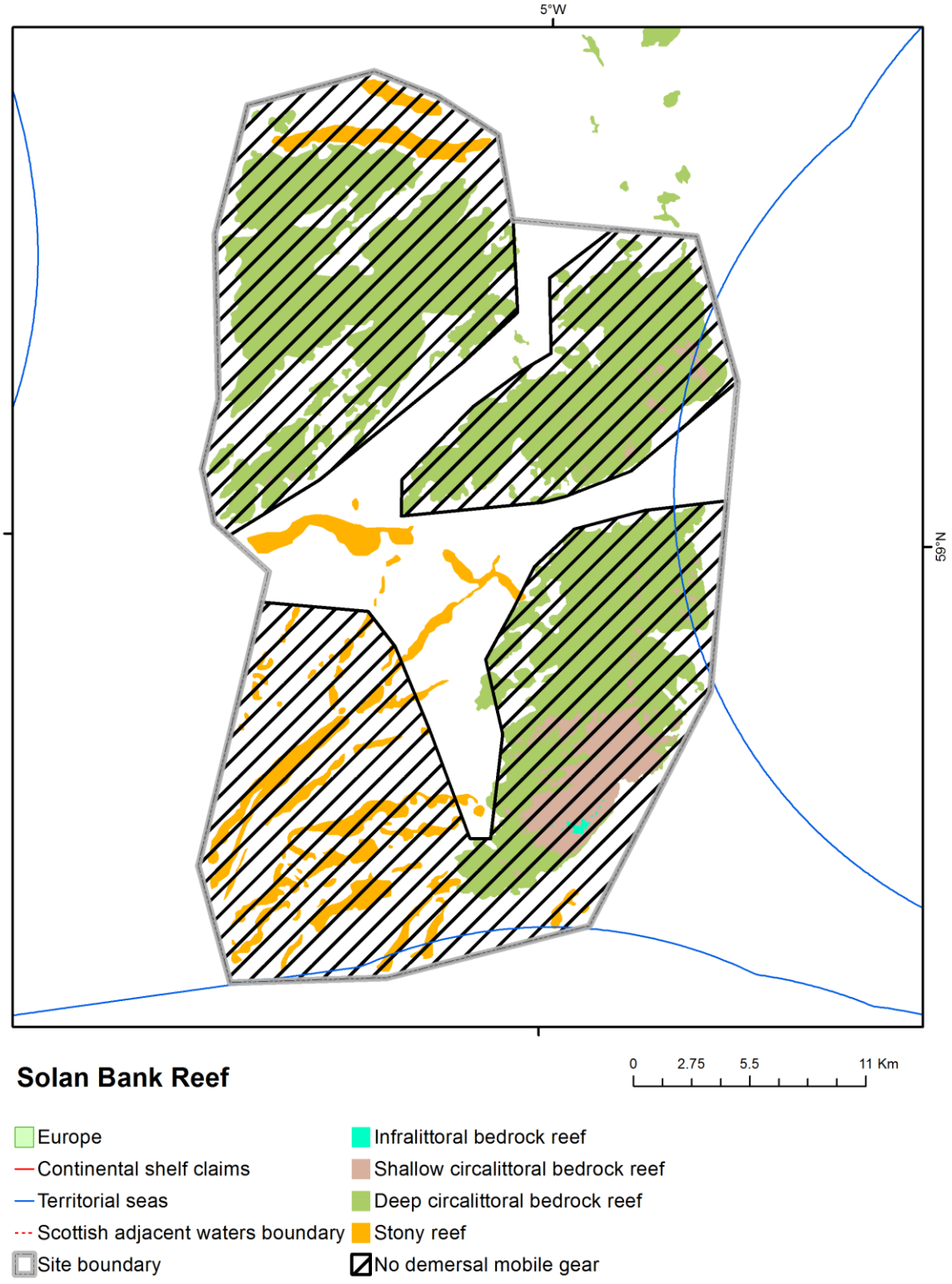


Figure E3: Solan Bank Reef SAC with proposed management measures

39 Fleet activity at Solan Bank Reef SAC

In this section the potential effect of the measures on fishing effort and value is estimated. These estimates are based on data from 2009 to 2013 using the methodology described in section 9.

39.1 Fishing effort

The management measures for this site apply to all demersal mobile gears. Therefore table E9 shows effort for all demersal mobile gears to produce a yearly average for each rectangle. In addition there is an average of 120 hours per year potting activity across the relevant ICES rectangles in the reference period.

Table E9: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Solan Bank SAC using demersal mobile gear

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
DEU	46E4	6	0	0
IRL	47E4	4	1	0
UK	46E4	685	109	41
UK	46E5	51	2	2
UK	47E4	526	92	69
UK	47E5	1894	83	76

39.2 Fishing value

Based upon the economic data provided by member states the value of the site, and the value of the management area can be derived. This is done by taking the proportion of the average for the relevant ICES rectangle based upon the amount of effort expended for each gear type in question. Table E10 show the average values derived for the reference period. This is depicted in Figure E4 through a kernel density estimation of Vessel Monitoring System data for demersal mobile gear.

Table E10: Estimated economic value of mobile gear fisheries affected by management measures at Solan Bank SAC (average of 2009 – 2013)[21]

Nation	gear	Avg annual value in relevant ICES rectangles (Euro)	Avg annual value in SAC (Euro)	Of which avg value affected by management (Euro)
UK	Bottom trawl	3,216,650	188,332	109,574

40 Assessment of potential displacement effects

The total displacement across all of the relevant ICES rectangles amounts to 5.9% of total effort (188 hours out of 3166 hours) which can be derived from table E9. This equates to around 8 days of fishing effort per year. This level of displacement can be absorbed by other existing fishing grounds in the relevant ICES rectangles.

[21] No economic value for demersal mobile gears in data from Ireland and Germany for this SAC although there was some VMS effort.

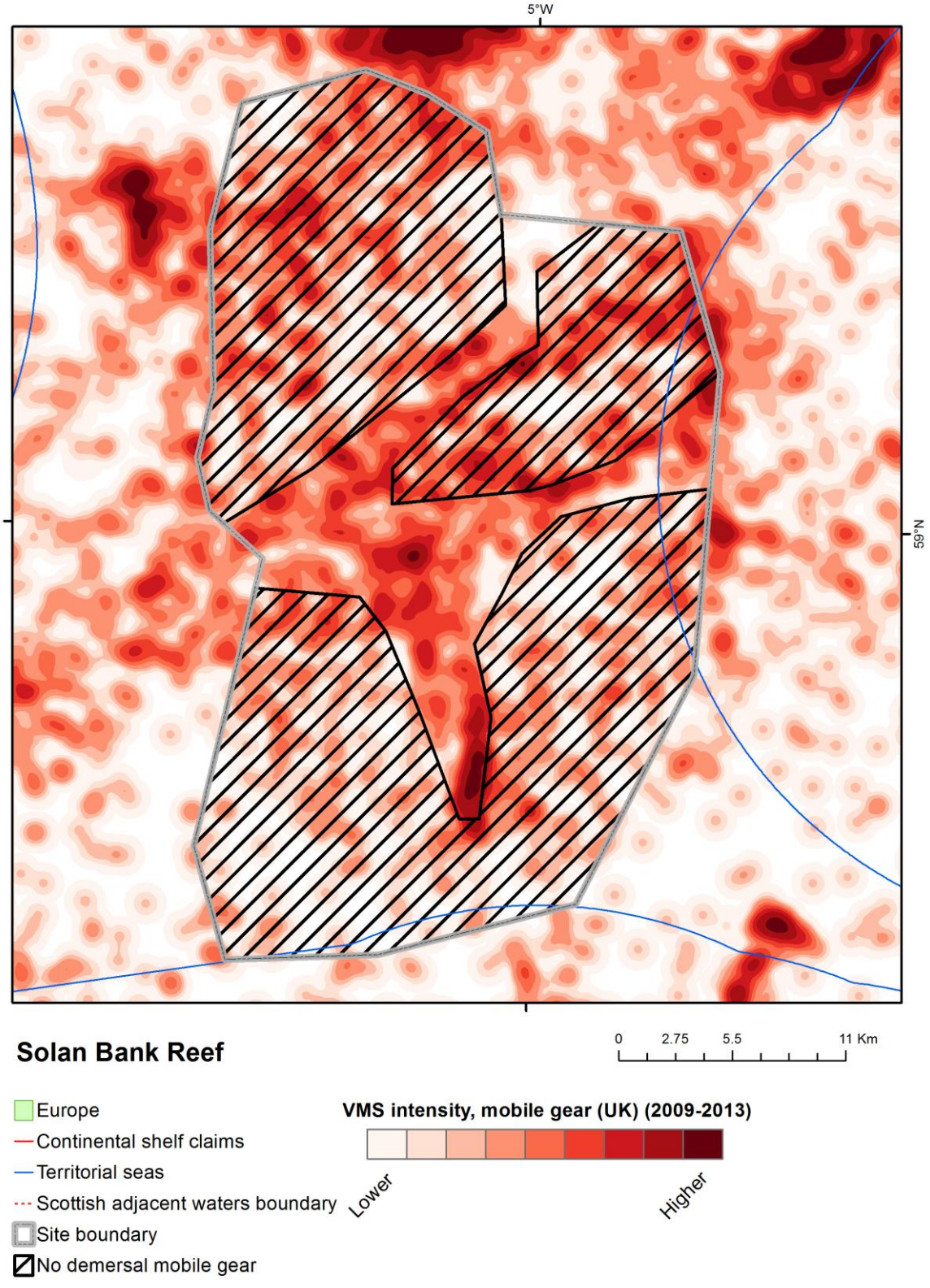


Figure E4: Solan Bank map of proposed measures with mobile fishing VMS intensity layer for UK vessels 2009-13

41 Appropriate Assessment

The management proposal for this site does not provide 100% protection of the reef habitat. Therefore an Appropriate Assessment in accordance with Article 6(3) of the EU Habitats Directive has been undertaken.

41.1 Fishing activity

This is described in this document at section 39 and in Figure E4.

The management proposal is described in sections 37 and 38, with the proposed management measures shown in Figure E3. Table E4 provides details of the reef subtypes present with the SAC, and the proportion of each that would be protected by the management measures. In this case 98% of bedrock reef and 80% of stony reef will be protected.

41.2 Requirements of the EU Habitats Directive

Article 6(3) of the Habitats Directive contains the condition that “Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives”

Continuation of commercial fishing activity potentially overlapping the Annex I feature of the SAC is not considered necessary to the management of the site. Therefore there is an obligation to apply the Likely Significant Effect test.

41.3 Test of Likely Significant Effect

A review of available sensitivity information was conducted to assess whether the proposed activities are likely to have a significant effect on the Annex I Reef within the Solan Bank Reef SAC.

41.3.1 Sensitivity of Solan Bank Reef SAC habitats to pressures associated with mobile fishing gear

According to JNCC Conservation Objectives and Advice on Operations (JNCC, 2013), the ongoing mobile demersal fishing activities (otter trawling) are associated with the following pressures at Solan Bank:

- Physical damage through physical disturbance or abrasion
- Biological disturbance through the selective extraction of species

41.3.2 Sensitivity assessment for Wyville-Thomson SAC

JNCC advice on Conservation Objectives and operations provides a generic sensitivity assessment for the features of the Solan Bank SCI. This assessment has been drawn principally from MarLIN's evaluation of the following biotope:

'Erect sponges, *Eunicella verrucosa* and *Pentapora fascialis* on slightly tideswept moderately exposed circalittoral rock (CR.HCR.XFa.ByErSp.Eun)'

It should be noted that this biotope is not identical to the habitats present within the MPA, but was considered the closest match for which a MarLIN sensitivity assessment was available and comparable in terms of functionality.

The JNCC overall sensitivity assessment for the pressures associated with the proposed trawling activities is presented below:

Physical damage through physical disturbance or abrasion

Physical abrasion (for example, by mobile fishing gear) can damage the interest feature and its typical species. Physical abrasion is likely to reduce the structural complexity of the feature (for example, by damaging erect epifaunal species such as *Alcyonium digitatum* and axinellid sponges) and reduce biodiversity through the selective removal of large, sessile, long-lived species from the community (Sewell and Hiscock, 2005). Many of the feature's typical species are permanently attached to the substratum and will not re-attach once displaced. Sensitivity to physical disturbance and abrasion is therefore assessed as high.

Biological disturbance through the selective extraction of species

The selective extraction of species by fisheries can include:

- Removal of target species
- Mortality of non-target species

The biological effects of fisheries can include the removal of target species and the mortality of non-target species. Fish associated with the reefs may be targeted by commercial fisheries. Where this occurs, these effects can lead to shifts in community structure (e.g. if predators are removed from the system) which then lead to indirect effects on the food web as a whole. It is important to note that due to the paucity of evidence on the biological sensitivity of the interest feature, our understanding is likely to evolve over time.

41.3.3 Likely Significant Effect test conclusion

Taking the available sensitivity information into account and the potential impact of mobile demersal gears, it is considered that the proposed operations could have a likely significant effect on the Annex I features of the sites. An Appropriate Assessment of the risks that on-going fishing activities may pose to the features of the sites is presented below.

41.4 Appropriate Assessment of risk to Annex I reef habitat

The site is designated for Annex I reef represented by the sub-types 'bedrock' and 'stony' reef (Figure E1). Bedrock outcrops create areas of high topography, with linear features (thought to be bedrock joint planes) forming cliffs of up to 10m in height above the surrounding seabed. Elsewhere the bedrock forms smooth and undulating features known as roches moutonnées (Sugden et al. 1992), created by the scour effect of moving glacial ice. Stony reef comprised of boulders and cobbles with a sandy veneer occurs in ridges to the north-west and south-west of the site; these most likely represent glacial moraine ridges (the tracks of sediment carried by glacial ice) (Whomersley et al. 2010). Boulders and cobbles also occur in the larger crevices in the bedrock while smaller rock fissures are filled with a mixture of coarse sand and shell/gravel veneer.

The reefs are characterised by encrusting fauna, mainly encrusting bryozoans and encrusting coralline algae in the shallower areas. Cup corals are present throughout the site, and brittlestars are common on both the bedrock and stony reef. Areas of flatter bedrock subject to sediment scour have a lower diversity of fauna than more sheltered areas. The highly scoured reef is mainly colonised by the keel worm *Pomatoceros triqueter* while a range of sponges, bryozoans and hydroids occur on less scoured reef areas (Whomersley et al. 2010). Water movement created by tidal streams and wave action is greater in shallower areas and here there is a higher abundance of species such as the soft coral *Alcyonium digitatum*, the cup coral *Caryophyllia smithii* and the jewel anemone *Corynactis viridis*. Foliose red algae and kelp grow in the shallowest locations where light penetrates the water.

Physical damage through physical disturbance or abrasion

Rocky habitats can vary in their hardness and therefore resistance to damage from towed demersal gears, however, harder examples of the substrate (e.g. metamorphic rocks) are typically more resistant to damage than softer examples. (e.g. shales and chalk).

Towing fishing gear across rocky substrates is likely to cause damage or death of attached species and reduce habitat complexity as boulders and cobbles associated with the hard substrate are moved around. Recovery times for impacted habitat are likely to be longer than for softer sediments although the current management proposal for Solan Bank SAC ensures the protection from mobile demersal gears of 94.8% of the reef feature, therefore the risk of not achieving the conservation objectives is substantially reduced.

Biological disturbance through the selective extraction of species

The biological effects of fisheries can include the removal of target species and the mortality of non-target species. However, species associated with the reef feature are likely to be exposed to a low level of disturbance from mobile gears as trawling effort is typically concentrated in sedimentary areas, targeting highly mobile fish species distributed more widely throughout the region.

41.5 Mitigation measures

No additional mitigation measures are being considered in this assessment.

41.6 Conclusion of site integrity test

Marine Scotland consider that the proposed operations would not represent an adverse effect on the site integrity of Solan Bank Reef SAC, primarily because;

There is no risk of reduction in reef extent from ongoing fishing activities

In 2009 to 2013 the parts of the SAC that would remain exposed to potential mobile gear fishing pressure were only fished for an average of 99 hours per year (derived from Table E9). This is the equivalent of less than 1 week of fishing pressure per year.

Continuation of activities may result in a temporary loss of amenity but it is expected that any effects would be reversible and recovery is likely in the longer term (Kaiser et al. 2006)

Section F

42 The Barra Fan and Hebrides Terrace Seamount Marine Protected Area (MPA)

42.1 Site description

The Barra Fan and Hebrides Terrace Seamount MPA is located to the west of Scotland, as shown in Figures 2 and F1. The MPA follows the seabed as it descends from the top of the Hebridean continental slope down into the Rockall Trough. The depth ranges around 200m to below 2000m and the site has an area of 4,373Km^2.

The continental slope in the eastern part of the MPA captures the biological diversity of sediments that change with depth. The base of the continental slope provides conditions for the establishment of burrowed mud habitat; specifically seapens and burrowing megafauna communities.

To the west of the site, the Hebrides Terrace Seamount rises to a height of almost 1km above the surrounding seabed and is thought to represent a remnant of an ancient volcano. The seamount supports a diverse range of habitats and species including cold-water corals and deep sea sponges.

42.2 Why the site was designated

All of the protected features of the site are considered to be a priority for marine conservation in Scotland's seas and are considered appropriate a spatial management approach. Further detail on the processes followed to identify priority marine features in Scottish offshore waters is publically available (JNCC, 2012b).

Seapens and burrowing megafauna, orange roughy (*Hoplostethus atlanticus*) and seamounts are listed by the OSPAR Commission as Threatened and/or Declining. Therefore this MPA makes a significant contribution to meeting obligations under the OSPAR convention.

More information regarding the site selection process for the Barra Fan and Hebrides Terrace Seamount MPA is available in the Detailed assessment against the Scottish MPA Selection Guidelines document.

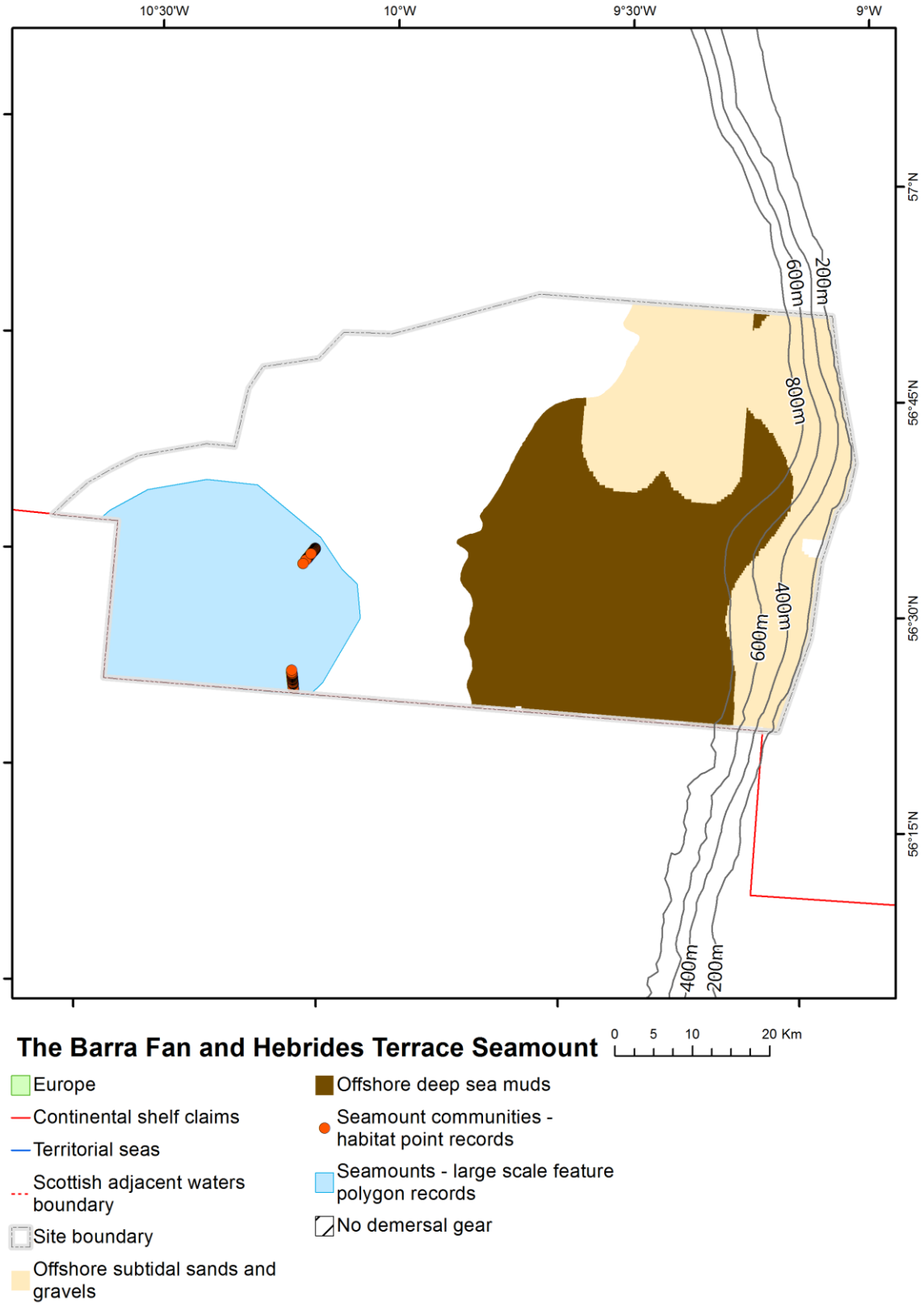


Figure F1: The Barra Fan and Hebrides Terrace Seamount MPA Including distribution of protected features

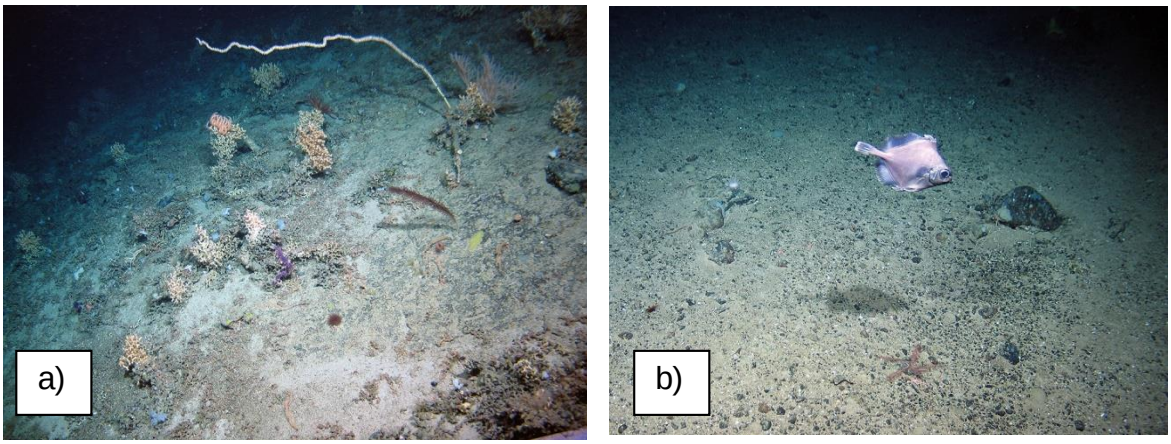


Figure F2: Examples of some of the protected features taken from the Barra Fan and Hebrides Terrace Seamount MPA, showing a) seamount communities, and b) sands and gravels ©Heriot-Watt University, JNCC and Natural Environment Research Council.

42.3 The site boundary

The boundary has been set in accordance with the boundary setting principles outlined in the MPA Selection Guidelines[22].

The boundary has been drawn to capture the biological diversity of sediments that change with depth and includes all clustered records of burrowed mud and seapens. It overlaps all depth strata down the slope to provide representation of the full range of associated biological communities which are reported to vary with depth (Hughes et al., 2014).

To the west, the boundary has been drawn to encompass the full extent of The Hebrides Terrace Seamount in Scottish waters and encompasses numerous geodiversity interests including the Barra Fan and Peach Slide Complex Key Geodiversity Areas (Brooks et al., 2013).

Confidence in the presence and extent of the protected features has been set out in The Barra Fan and Hebrides Terrace Seamount MPA Data Confidence Assessment

[22] http://www.scotland.gov.uk/Topics/marine/marine-environment/mpanetwork/mpaguidelines

42.4 Conservation Objectives

Subject to natural change, conserve the seamount communities, burrowed mud, offshore deep-sea muds, offshore subtidal sands and gravels in favourable condition, such that for each feature:

- its extent is stable or increasing; and
- its structures and functions, its quality, and the composition of its characteristic biological communities are such as to ensure that it is in a condition which is healthy and not deteriorating.

Subject to natural change, conserve orange roughy in favourable condition, such that:

- the species has continued access to resources provided by the MPA for, but not restricted to, feeding, courtship, spawning or use as nursery grounds;
- the extent and distribution of any supporting features upon which the species is dependent is conserved or, where relevant, recovered; and
- the structure and function of any supporting features, including any associated processes supporting the species within the MPA, is such as to ensure that the protected feature is in a condition which is healthy and not deteriorating.

More information regarding the conservation objectives is available in the Designation Order.

43 Anthropogenic pressures

43.1 All demersal mobile gear (including dredge, beam trawl, bottom trawl, and seines)

Studies have shown that areas of mud habitats (which include burrowed mud and offshore deep-sea mud) subject to mobile fishing activity support a modified biological community with lower diversity, reduction or loss of long-lived filter-feeding species and increased abundance of opportunistic scavengers (Ball et al., 2000; Tuck et al., 1998). This effect was greatest in the more heavily fished offshore areas suggesting that impact is related to the intensity of fishing (Ball et al., 2000). Furthermore, modelling studies suggest that the greatest impact is produced by the first pass of a trawl (Hiddink et al., 2006).

Where sand and gravel sediments occur in high energy locations (i.e. of wave and/or tide exposed) the associated fauna tend to be well adapted to disturbance and as a result are more tolerant of fishing-related disturbance (Dernie et al., 2003; Hiddink et al., 2006). However, in lower energy deep water locations such as the Barra Fan and the Hebridean Slope, sediments tend to be more stable and their associated fauna less tolerant of disturbance (Hiddink et al., 2006; Kaiser et al., 2006). Stable gravels often support a 'turf' of fragile species which are easily damaged by trawling and recover slowly (Collie et al., 2005; Foden et al., 2010).

Trawling and dredging tend to cause increased mortality of fragile and long lived species and favour opportunistic, disturbance-tolerant species (Eleftheriou & Robertson, 1992; Bergman & van Santbrink, 2000). Some particularly sensitive species may disappear entirely (Bergman & van Santbrink, 2000). The net result is benthic communities modified to varying degrees relative to the un-impacted state (Bergman & van Santbrink, 2000; Kaiser et al., 2006).

The species associated with seamount communities tend to be composed of erect and fragile species that are sensitive to physical disturbance, particularly deep-sea stony corals, gorgonians and black corals, sea anemones, hydroids and sponges (Clark & Tittensor, 2010; Clark et al., 2010).

Trawling can cause mortality to species by disturbance on the seabed or by bringing them to the surface resulting in a reduction in abundance (Kaiser et al., 1996; Jennings & Kaiser, 2008; ICES, 2010). Recovery from such damage is estimated to be measured in decades, depending on the environmental conditions (Clark et al., 2010; ICES, 2010).

In the 1990's, a targeted demersal otter trawl fishery for orange roughy occurred in deep water west of Scotland. However, in recent years, a zero Total Allowable Catch (TAC) was implemented for orange roughy in ICES Division area VI, which has effectively ended the fishery in this region. As a result, orange roughy has not been considered further in the context of the management options below. However, if the zero TAC measure were to be lifted in the future, it may be necessary to identify management options for fisheries targeting orange roughy within this MPA.

43.2 All demersal static gear (including gillnets, trammel nets, long lines, pots and traps)

Only the seamount communities feature within the Barra Fan and Hebrides Terrace Seamount MPA is considered to be sensitive to static gear. Impacts occurring on analogous vulnerable habitats and species, such as sponges and corals in Scottish waters are applicable (Muñoz et al., 2010).

Impacts can arise from hooks, lines, nets and ropes becoming entangled with corals and other fragile species, including 'plucking' them from the seabed during hauling (Mortensen et al., 2005 ; Muñoz et al., 2010; OSPAR, 2010). While the degree of damage from individual fishing operations is likely to be lower than for trawling, cumulative damage may be significant.

44 Proposed fisheries management measures

This section provides details of how the measures were determined.

44.1 Options considered for fisheries management

Table F1 provides a summary of the management advice set out against the various options that have been considered.

Table F1: Summary of fisheries management advice

Activity	Management options considered
Demersal mobile gear	**No additional management:** There is a risk of not achieving the conservation objectives for burrowed mud, offshore deep sea muds and offshore subtidal sands and gravels. The conservation objective would not be achieved for seamount communities and JNCC recommend that this option should not be applied for this feature.
	Reduce/limit pressures: This option would reduce, but not entirely eliminate, the risk of not achieving the conservation objectives for burrowed mud, offshore deep sea muds and offshore subtidal sands and gravels. Appropriate management could include restrictions on fishing with damaging gears over a proportion of the extent of each of these features, and there may be a greater requirement for restrictions on gears that penetrate deeply into the sediment. The location of areas to be covered by management restrictions would be decided in consultation with fishers. Restrictions could be permanent in some cases or temporary/adaptive in others. If applied to the steep flanks of the seamount feature between depths where seamount communities are known to occur, this option would reduce, but not entirely eliminate the risk of seamount communities not achieving their conservation objectives.
	Remove/avoid pressures: This option would reduce the risk of not achieving the conservation objectives for burrowed mud, offshore deep sea muds, and offshore subtidal sands and gravels to the lowest possible levels. This option would reduce the risk ofthe seamount communities feature not achieving its conservation objective to the lowest possible level. JNCC recommend that this option should be applied to the entirety of the seamount feature in Scottish waters.
Demersal static gear	**No additional management**: This option is considered to be sufficient for bottom contact static gear to achieve the conservation

Activity	Management options considered
	objectives for burrowed mud, offshore deep sea muds, and offshore subtidal sands and gravels. However, the conservation objective would not be achieved for seamount communities.
	Reduce/limit pressure: The conservation objective would not be achieved for seamount communities.
	Remove/avoid pressure: This is the only option that would achieve the conservation objective for seamount communities and JNCC recommend that this option should be applied where this feature is present.

44.2 Proposed management option and rationale

Table F2 provides details of the chosen management approach and further explanation is provided below.

Table F2: chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Seamount communities	Demersal mobile and static gear	Remove / avoid pressure	Exclusion of all demersal gears from the entirety of the Hebrides terrace seamount where the feature occurs.
Offshore sands and gravels / Deep sea muds	Demersal mobile gear	Reduce / limit pressure	Zonal exclusion of mobile demersal gears from depths greater than 800m.

Seamount communities are amongst the most sensitive habitats to the impacts of fishing gears. There is no other approach that will further the conservation objectives for the seamount part of the MPA.

For the sedimentary habitats the management boundary for demersal mobile gears has been drawn on the 800m contour. This means that trawling can continue in depths less than 800m where a significant amount of the trawling takes place. Below 800m the collateral damage to vulnerable species exceeds the commercial return from trawl fisheries (Clarke et al., 2015). Therefore, continued trawl activity below that depth would not be considered a sustainable use of the MPA.

44.3 Other fisheries measures which apply to the MPA

It should be noted that this proposal to prohibit trawling in waters greater than 800m may be overtaken by the new EU-wide Deep Sea Fisheries Regulation. This is expected to come into force in early 2017.

45 Measures envisaged for control, enforcement and compliance

This section describes the measures that are proposed for implementation.

45.1 Vessel Monitoring System

The frequency of data transmissions shall remain at least once every 120 minutes.

45.2 Key provisions to include in EC Regulation

Table F3 provides details of the gear types to be prohibited by the measures and Table F4 provides co-ordinates of the area to which the measures should be applied for all demersal fishing gears. Table F5 provides co-ordinates of the area to which the measures should be applied for all demersal mobile fishing gears. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figure F3.

Table F3: Demersal fishing gears to be prohibited

Gear types to be prohibited by the proposed measures	Habitat / Species	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	Burrowed mud (seapen and burrowing megafauna communities), seamount communities, offshore deep-sea muds, offshore subtidal sands and gravels, orange roughy	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredges		DRB	DRB, DRH
Gillnets and entangling nets	Seamount communities	GN, GNC, GND, GNS, GTN, GTR	GEN, GN, GNC, GND, GNS, GTN, GTR
Hooks and lines		LHM, LHP, LL, LLD, LLS, LTL, LX	LHM, LHP, LLS, LLD, LL, LTL, LX
Pots and traps		FIX, FPO	FIX, FPO, FYK

Table F4: Co-ordinates of prohibited area (all demersal fishing gears)

Point	Latitude	Longitude
A	56° 32.500' N	010° 38.280' W
B	56° 33.519' N	010° 36.697' W
C	56° 34.958' N	010° 34.220' W
D	56° 35.982' N	010° 31.569' W
E	56° 37.139' N	010° 28.254' W
F	56° 38.375' N	010° 19.791' W
G	56° 38.350' N	010° 16.163' W
H	56° 38.415' N	010° 11.312' W
I	56° 34.760' N	010° 01.754' W
J	56° 30.828' N	009° 54.815' W
K	56° 26.578' N	009° 53.429' W
L	56° 21.615' N	009° 57.980' W
M	56° 21.500' N	010° 30.000' W
N	56° 32.500' N	010° 30.000' W

Table F5: Co-ordinates of prohibited area (dredge, beam trawl, bottom trawl, and seines)

Point	Latitude	Longitude
O	56° 38.350' N	010° 16.163' W
P	56° 42.486' N	010° 15.095' W
Q	56° 44.092' N	010° 13.489' W
R	56° 44.984' N	010° 06.529' W
S	56° 46.948' N	010° 03.673' W
T	56° 47.126' N	009° 57.606' W
U	56° 50.706' N	009° 39.394' W
V	56° 50.710' N	009° 07.399' W
W	56° 42.525' N	009° 04.131' W
X	56° 39.004' N	009° 05.881' W
Y	56° 35.817' N	009° 10.966' W
Z	56° 33.938' N	009° 12.587' W
AA	56° 25.407' N	009° 10.749' W
AB	56° 21.537' N	009° 11.847' W
AC	56° 21.615' N	009° 57.980' W
AD	56° 26.578' N	009° 53.429' W
AE	56° 30.828' N	009° 54.815' W
AF	56° 34.760' N	010° 01.754' W
AG	56° 38.415' N	010° 11.312' W

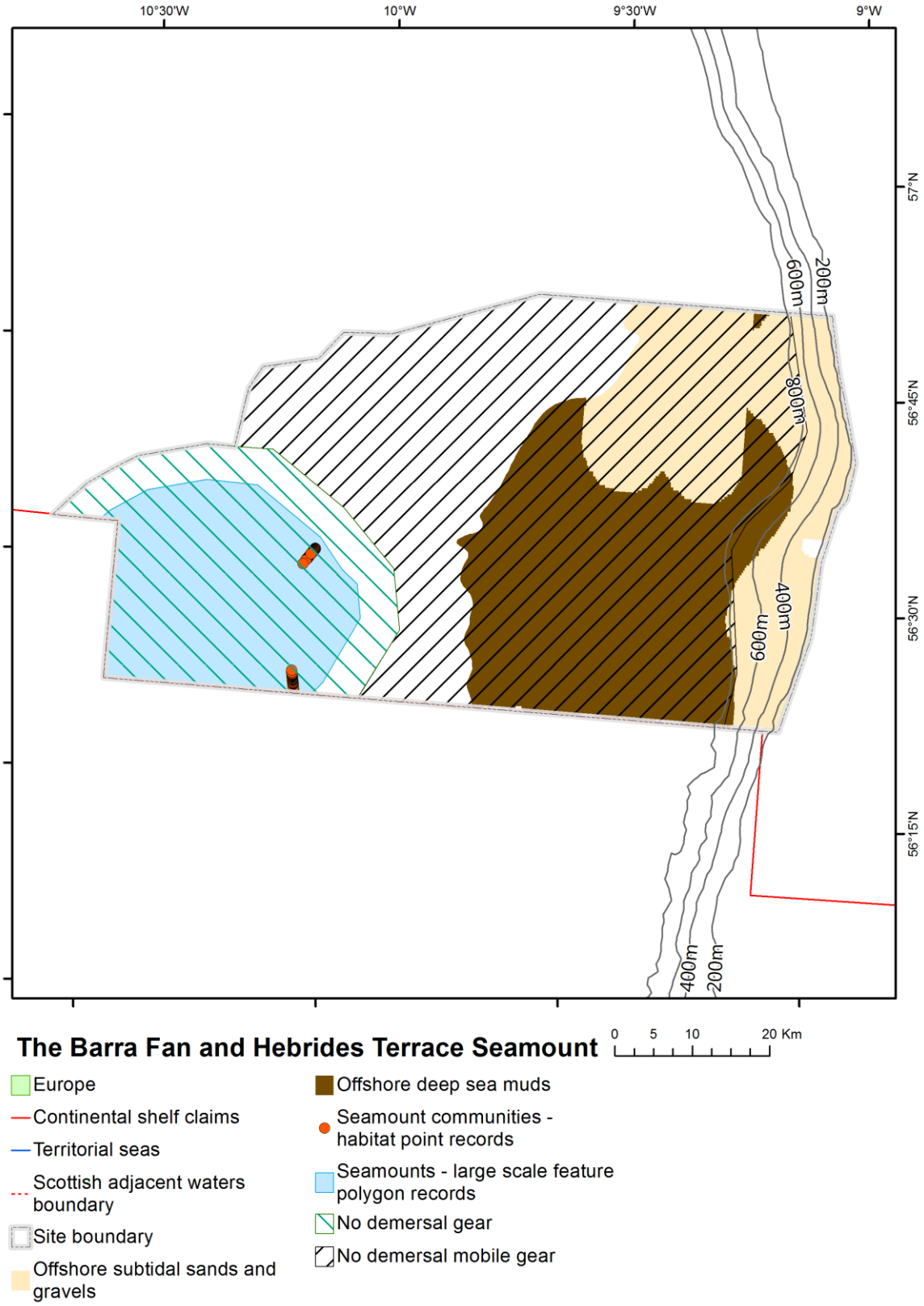


Figure F3: The Barra Fan and Hebrides Terrace Seamount MPA map of features in relation to the proposed measures.

46 Fleet activity at The Barra Fan and Hebrides Terrace Seamount MPA

In this section the potential effect of the measures on fishing effort and value is estimated. These estimates are based on data from 2009 to 2013 using the methodology described in section 9.

46.1 Fishing effort

The management measures for this site apply to all demersal gears in various extents. Therefore tables F6 – F9 estimates the level of fishing effort on going in the relevant ICES rectangles and the amount that would be affected by the proposed measures.

Table F6: Average yearly effort (2009 – 2013) per ICES rectangle relevant to The Barra Fan and Hebrides Terrace Seamount MPA using bottom trawl

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
FRA	41D9	38	38	38
FRA	41E0	427	426	201
FRA	42D9	6	6	6
FRA	42E0	1423	1006	551
FRA	42E1	22	20	0
IRL	41E0	2	0	0
IRL	42E0	7	3	0
IRL	42E1	136	1	0
UK	41E0	10	9	2
UK	42E0	174	73	16
UK	42E1	67	1	0

Table F7: Average yearly effort (2009 – 2013) per ICES rectangle relevant to The Barra Fan and Hebrides Terrace Seamount MPA using gill net

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
IRL	41E0	1	1	0
IRL	42E0	17	6	0
IRL	42E1	87	1	0

Table F8: Average yearly effort (2009 – 2013) per ICES rectangle relevant to The Barra Fan and Hebrides Terrace Seamount MPA using long lines

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
ESP	41E0	102	101	0
ESP	42D9	1	0	0
ESP	42E0	147	134	0
ESP	42E1	9	7	0
FRA	41E0	2	2	0
FRA	42E0	2	1	0
UK	41E0	59	58	0
UK	42E0	117	90	0

Table F9: Average yearly effort (2009 – 2013) per ICES rectangle relevant to The Barra Fan and Hebrides Terrace Seamount MPA using pots

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
UK	42E0	1	0	0
UK	42E1	23	2	0

46.2 Fishing value

Based upon the economic data provided by member states the value of the site, and the value of the management area can be derived. This is done by taking the proportion of the average for the relevant ICES rectangle based upon the amount of effort expended for each gear type in question. Table F10 show the average values derived for the reference period. This is depicted in Figures F4 to F6 through a kernel density estimation of Vessel Monitoring System data for demersal mobile gear, and F7 to F9 for demersal static gear.

Table F10: Estimated economic value of mobile gear fisheries at The Barra Fan and Hebrides Terrace Seamount MPA (average of 2009 – 2013)

Nation	gear	Avg annual value in relevant ICES rectangles (Euro)	Avg annual value in MPA (Euro)	Of which avg value affected by management (Euro)
FRA	Bottom trawl	2,851,456	2,226,398	924,954
IRL	Bottom trawl	432,845	11,941	0
UK	Bottom trawl	432,656	158,871	34,614

47 Assessment of potential displacement effects

The total displacement of demersal mobile gears across the relevant ICES rectangles is relatively high at 35.2% (814 hours out of 2312 hours). However all of this activity is below the 800m depth limit proposed by the new EU deep sea regulation which likely to be implemented before these proposals. As such, no additional displacement effects are expected as a result of the current MPA management proposal.

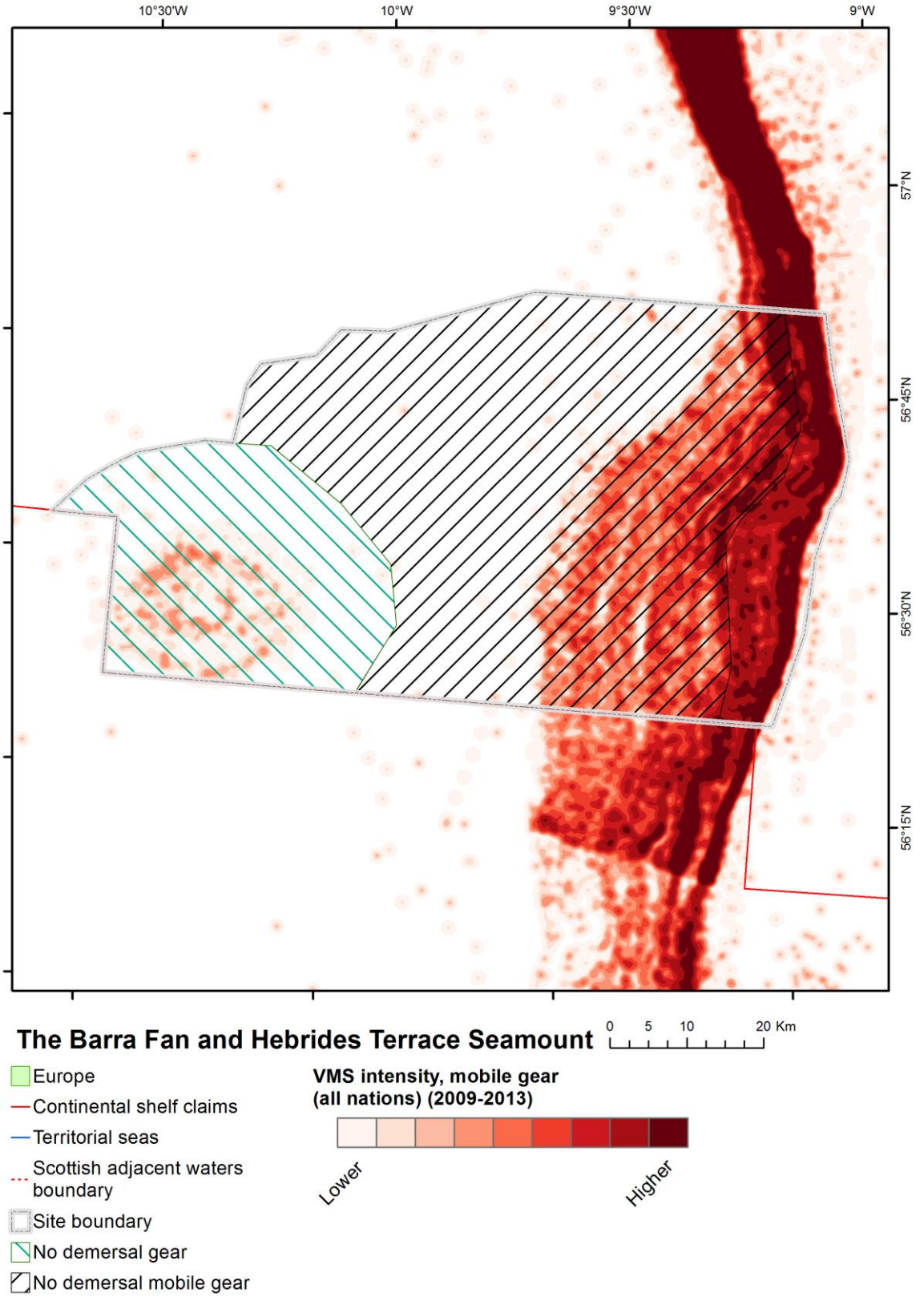


Figure F4: The Barra Fan and Hebrides Terrace Seamount map of proposed measures with mobile fishing VMS intensity layer for all vessels 2009-13

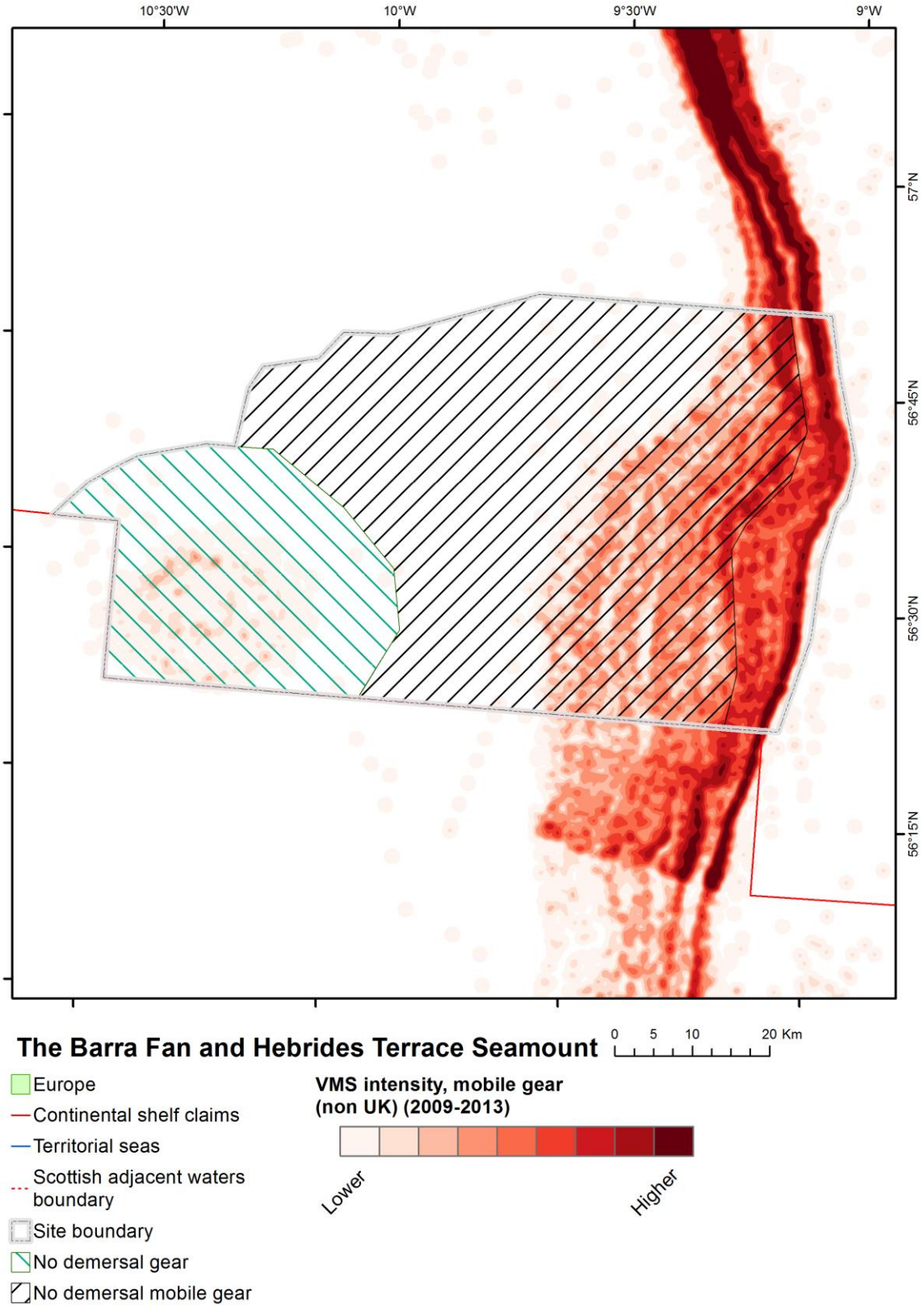


Figure F5: The Barra Fan and Hebrides Terrace Seamount map of proposed measures with mobile fishing VMS intensity layer for non-UK European Union vessels 2009-13

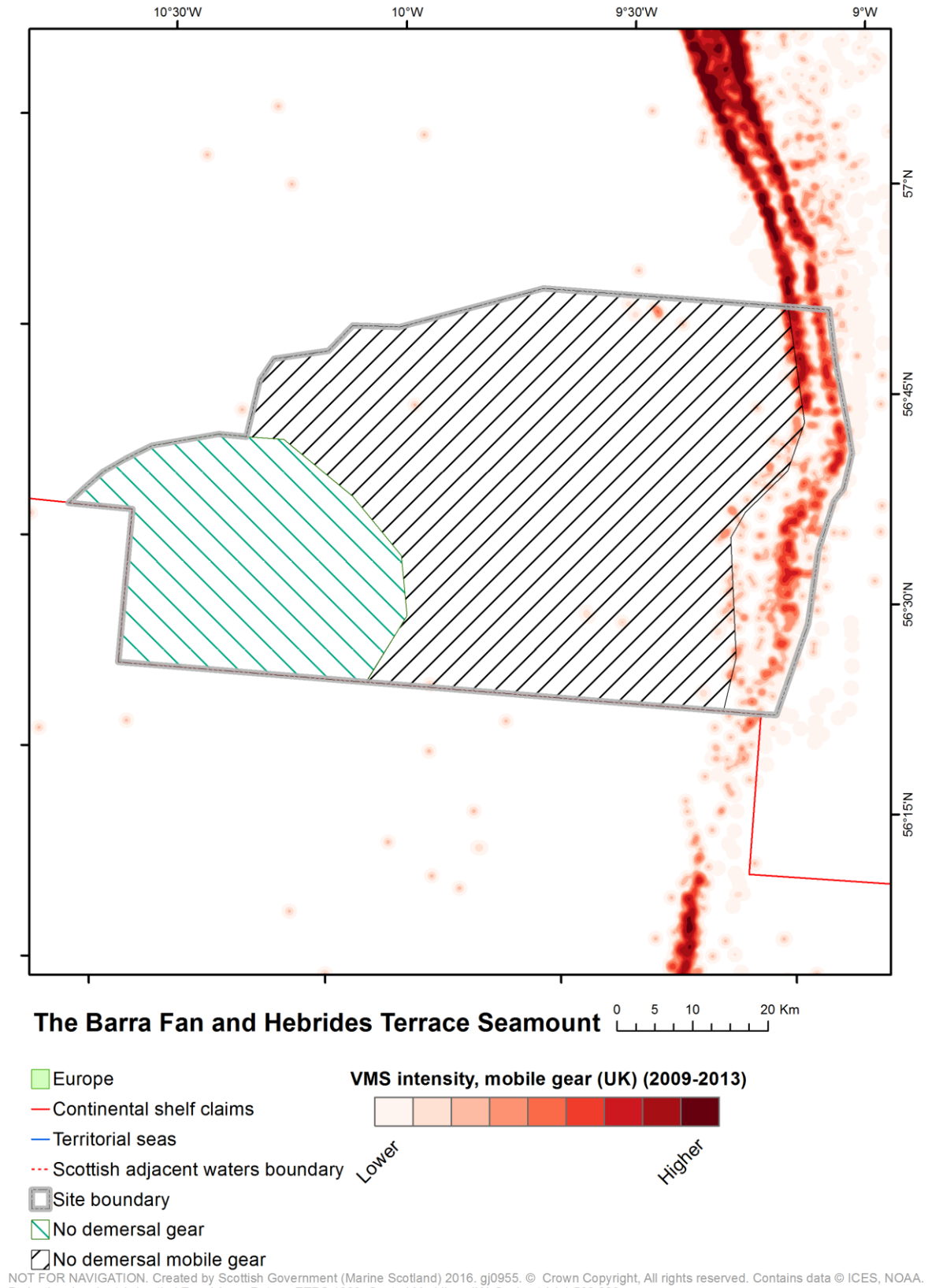


Figure F6: The Barra Fan and Hebrides Terrace Seamount map of proposed measures with mobile fishing VMS intensity layer for UK vessels 2009-13

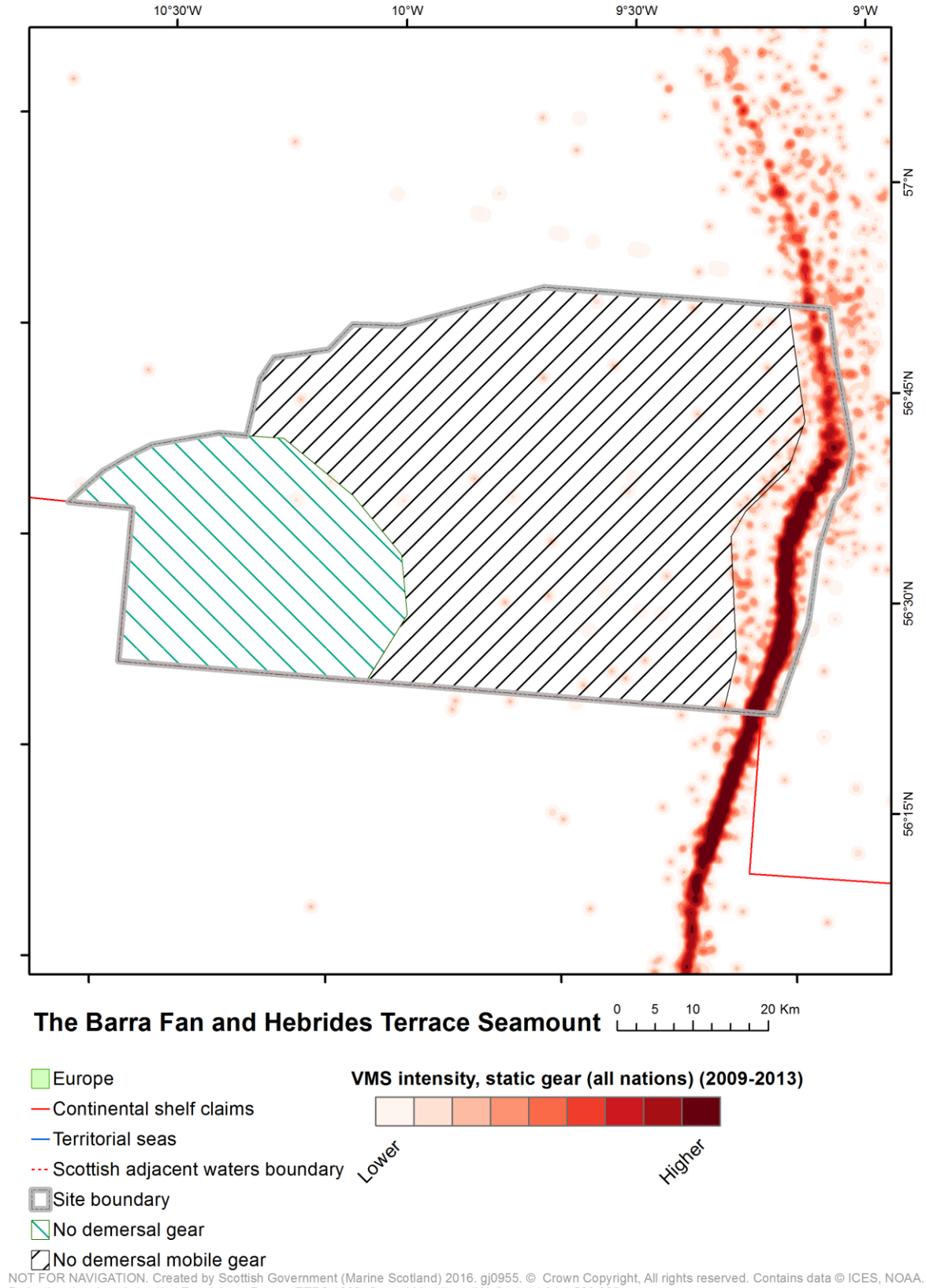


Figure F7: The Barra Fan and Hebrides Terrace Seamount map of proposed measures with static fishing VMS intensity layer for all vessels 2009-13

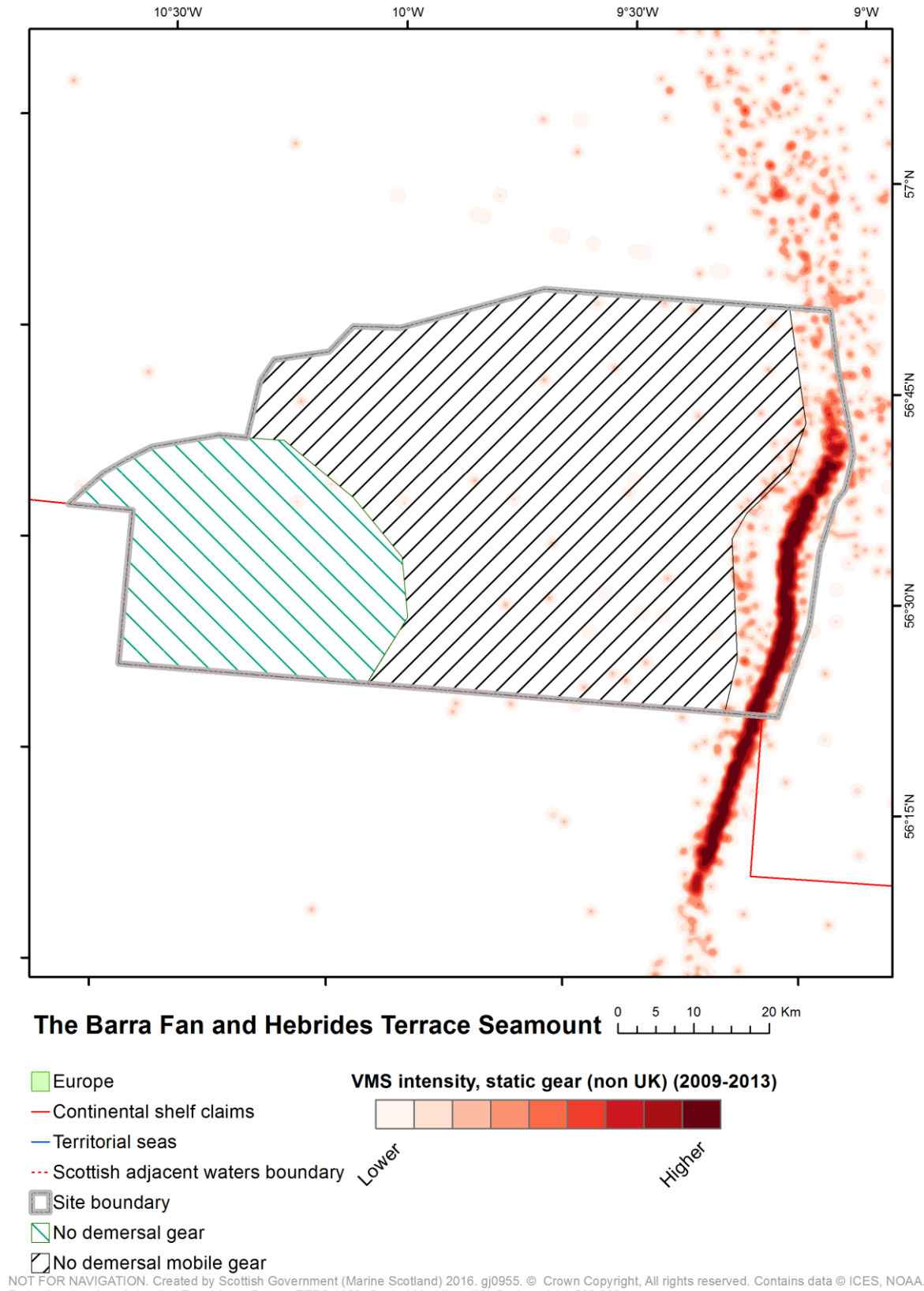


Figure F8: The Barra Fan and Hebrides Terrace Seamount map of proposed measures with static fishing VMS intensity layer for non-UK European Union vessels 2009-13

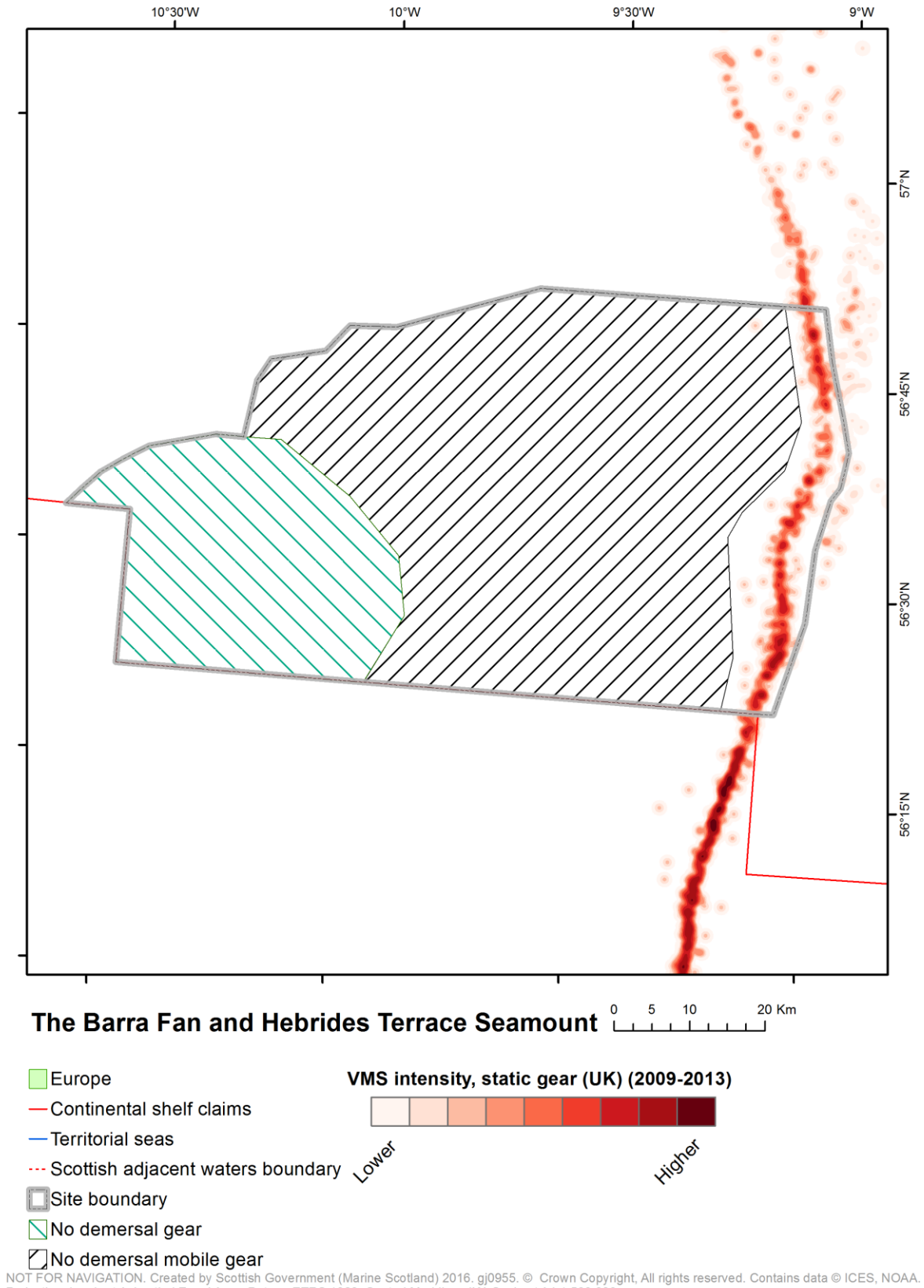


Figure F9: The Barra Fan and Hebrides Terrace Seamount map of proposed measures with static fishing VMS intensity layer for UK vessels 2009-13

Section G

47 West Shetland Shelf Marine Protected Area (MPA)

47.1 Site description

Lying to the north of Scotland, the West Shetland Shelf MPA provides an important example of the northern extent of sand and gravel habitats on the Scottish continental shelf. The MPA has an area of 4,083km^2, and is shown in Figures 2 and G1.

The different types of sand and gravel habitats support particularly rich diversity of wildlife. On the surface anemones, cup sponges (*Axinella infundibuloformis*) and several types of crustaceans including hermit crabs and squat lobster (*Munida rugosa*) can be found living between small rocks, whilst urchins and starfish (such as *Porania pulvillus* and *Asterias rubens*) are typical fauna living on the surface of the sandier sediments (Figure G2). Bryozoans and encrusting sponges are often found growing on the surface of cobbles and pebbles. Sea snails, bivalves such as scallops, keel worms and sand mason worms (*Lanice conchilega*) are adapted to living buried into the sand to avoid predators

47.2 Why the site was designated

The protected feature of the site is considered to be a priority in terms of marine conservation in Scotland's seas and appropriate for a spatial management approach. Further detail on the processes followed to identify priority marine features in Scottish offshore waters is publically available (JNCC, 2012b).

The MPA provides a coherent example of offshore subtidal sand and gravel habitats in OSPAR Regions II and III. It was chosen because it overlaps with the fisheries restriction area, known locally as the windsock, (Regulation No 227/2013 of the European Parliament and of the Council[23]) which is currently managed for the recovery of cod stocks.

[23] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0227&from=EN

More information regarding the site selection process for the West Shetland Shelf MPA is available in the Detailed assessment against the Scottish MPA Selection Guidelines document.

47.3 The site boundary

The boundary was set in accordance with the boundary setting principles outlined in the MPA Selection Guidelines[24]. It encompasses the distribution of a range of offshore subtidal sand and gravel habitats representative of OSPAR Regions II and III, indicated by the predictive seabed habitat modelling of the EUSeaMap Project and verified by Particle Size Analysis data from sediment samples, seabed photographic imagery and grab sample data from surveys.

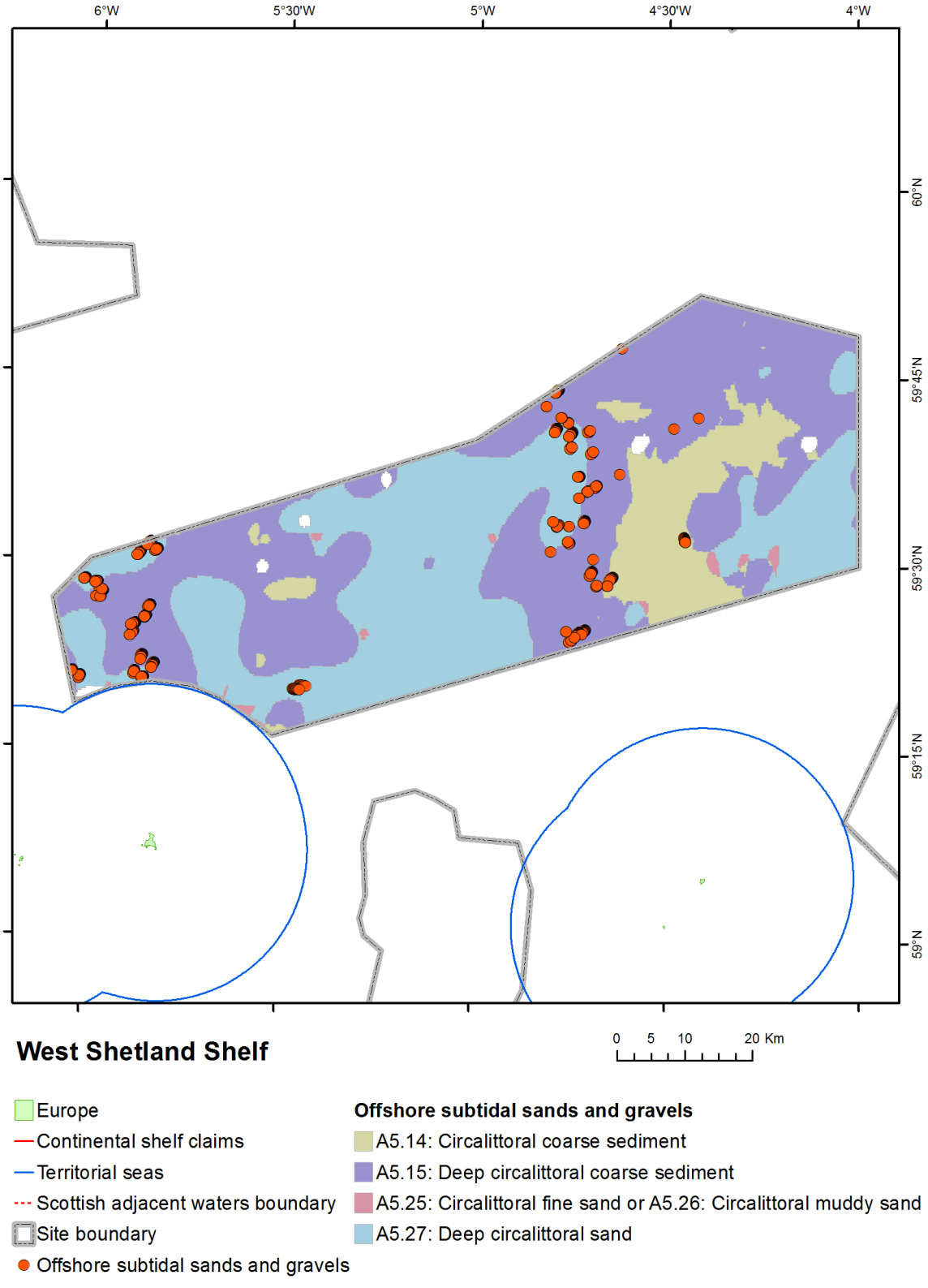
47.4 Conservation objectives

The Conservation Objectives for the protected feature of the MPA are to, subject to natural change, conserve the offshore subtidal sands and gravels feature in favourable condition, such that:

- its extent is stable or increasing; and
- its structure and functions, its quality, and the composition of its characteristic biological communities are such as to ensure that it is in a condition which is healthy and not deteriorating.

More information regarding the conservation objectives is available in the Designation Order.

[24] http://www.scotland.gov.uk/Topics/marine/marine-environment/mpanetwork/mpaguidelines



Projection: Lambert Azimuthal Equal Area. Datum: ETRS 1989. Central Meridian: 4W Scale at A4 1:687,570

Figure G1: West Shetland Shelf MPA site map including distribution of the protected feature

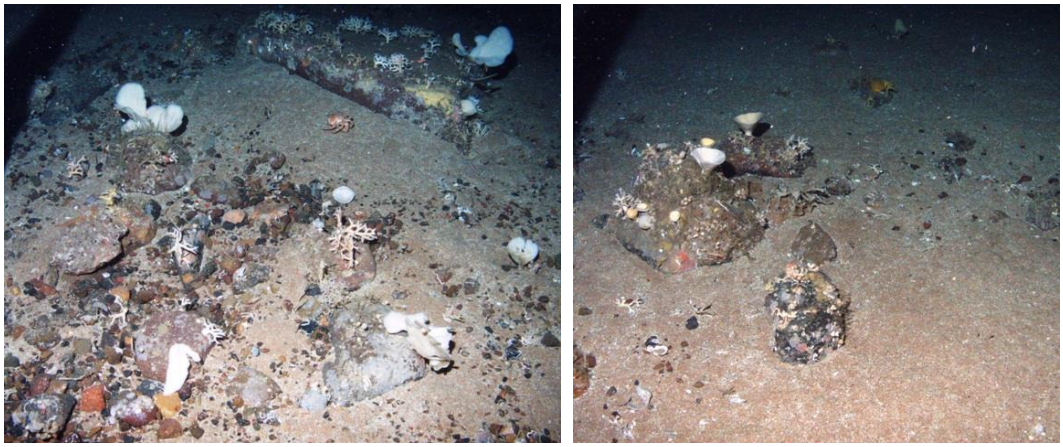


Figure G2: Examples of the offshore subtidal sands and gravels protected feature taken within the West Shetland Shelf MPA (©JNCC & Marine Scotland Science)

48 Anthropogenic pressures

48.1 All demersal mobile gear (including dredge, beam trawl, bottom trawl, and seines)

In general, the impact of mobile bottom contact gear on sand and gravel sediments is relatively well understood. In high energy locations (i.e. of wave and/or tide exposed) the associated fauna tend to be well adapted to disturbance and as a result are more tolerant of fishing-related disturbance (Dernie et al., 2003; Hiddink et al., 2006). In lower energy locations, such as muddy sands and sand in deep water, sediments tend to be more stable and their associated fauna less tolerant of disturbance (Hiddink et al., 2006; Kaiser et al., 2006). Stable gravels often support a 'turf' of fragile species which are easily damaged by trawling and recover slowly (Collie et al., 2005; Foden et al., 2010). Trawling and dredging tend to cause increased mortality of fragile and long lived species and favour opportunistic, disturbance-tolerant species (Eleftheriou & Robertson, 1992; Bergman & van Santbrink, 2000). Some particularly sensitive species may disappear entirely (Bergman & van Santbrink, 2000).

We cannot be certain regarding the sensitivity of the protected feature across the full extent of the site. However, there is a possibility that exposure to bottom contacting gears may result in some degree of modification relative to the un-impacted state (Bergman & van Santbrink, 2000; Kaiser et al., 2006).

48.2 All demersal static gear (including gillnets, trammel nets, long lines, pots and traps)

The protected feature within the site is not considered sensitive to static gear activity. The individual impact of a single fishing operation may be slight but cumulative damage may be significant (Eno et al., 2001; Foden et al., 2010). Sensitivity to low intensity potting is considered low (Hall et al., 2008).

48.3 Other human activities

One telecommunications cable crosses the north-east boundary of the site.

49 Proposed fisheries management measures

This section provides details of how the measures were determined.

49.1 Options considered for fisheries management

Table G1 provides a summary of the management advice set out against the various options that have been considered.

Table G1: Summary of fisheries management advice for West Shetland Shelf MPA

Activity	Management options considered
Demersal mobile gear	**No additional management:** Mobile gear fisheries within the MPA are currently restricted under Common Fisheries Policy regulations due to overlap with an area closed under the cod-recovery plan (known as the "Windsock"). However, as the regulations were designed to facilitate cod recovery, the restrictions imposed do not apply to all mobile demersal gears and thus there is a risk of not achieving the conservation objective for offshore subtidal sands and gravels.
	Reduce/limit pressures: This option would reduce, but not entirely eliminate, the risk of not achieving the conservation objective for offshore subtidal sands and gravels. Appropriate management could include a zoned approach, where management measures would apply to all (not just trawl and seine) potentially impacting gears to protect a proportion of the feature representing the full diversity of sand and gravel habitats across the site. There may be

Activity	Management options considered
	a greater requirement for restrictions on gears that penetrate deeply into the sediment. The location of areas to be covered by management restrictions would be decided in consultation with fishers. Restrictions could be permanent in some cases or temporary/adaptive in others
	Remove/avoid pressures: This option would minimise the risk of not achieving the conservation objectives for offshore subtidal sands and gravels to the lowest possible levels. This is likely to include restrictions on gears that could impact the feature, such as otter trawling and scallop dredging.
Demersal static gear	**No additional management:** It is unlikely that any additional management of creeling and potting activities will be required, as the risk of not achieving the conservation objective for offshore subtidal sands and gravels associated with these activities is minimal. However, if static gear fishing activities were to increase or monitoring showed evidence of detrimental effects, it may be necessary to apply limits in the future.

49.2 Proposed management approach and rationale

Table G2 provides details of the chosen management approach and further explanation is provided below.

Table G2: Chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Offshore sands and gravels	Demersal mobile gear	Reduce / limit pressure	Prohibit use of dredges and beam trawls in the MPA. Prohibit demersal trawl and seine in 50% of the MPA. This second measure only needs to be implemented if the Cod recovery closure is removed from conservation regulations.

In the assessment period there has been no use of dredges or beam trawls within the site. It is believed that it may have been tried once or twice a long time ago. There we have concluded that use of that gear type should be prohibited on a precautionary basis. This ensures that there will be no increase in pressure in the future.

At the stakeholder workshop it was agreed that in the event of the existing fisheries closure being revoked that a proposal to keep 50% of the MPA closed to trawling would be put forward.

49.3 Other fisheries measures which apply to the site

The existing windsock restrictions effectively remove pressure from demersal trawl and seine net. Therefore the current measures further the conservation objectives for this MPA.

50 Measures envisaged for control, enforcement and compliance

This section describes the measures that are proposed for implementation.

50.1 Vessel Monitoring System

The frequency of data transmissions shall be of at least once every 60 minutes when a vessel with demersal mobile gear is present in the MPA.

50.2 Key provisions to include in EC Regulation

Table G3 provides details of the gear types to be prohibited by the measures and Table G4 provides co-ordinates of the area to which the measures should be applied for beam trawl and dredge. Table G5 provides co-ordinates of the area to which the measures should be applied for bottom trawl and seines. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figure G3.

Table G3: Demersal fishing gears to be prohibited

Gear types to be prohibited by the proposed measures	Habitat	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	Offshore subtidal sands and gravels	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredges		DRB	DRB, DRH

Table G4: Co-ordinates of prohibited area (beam trawl and dredges)

Point	Latitude	Longitude
A	59° 30.016' N	004° 00.000' W
B	59° 16.185' N	005° 31.195' W
C	59° 19.051' N	005° 39.422' W
D	59° 19.960' N	005° 43.890' W
E	59° 20.290' N	005° 49.837' W
F	59° 19.708'N,	005° 56.502' W;
G	59° 18.443'N,	006° 01.946' W;
H	59° 26.783' N	006° 05.802' W
I	59° 30.007' N	006° 00.000' W
J	59° 40.001' N	005° 00.000' W
K	59° 51.702' N	004° 24.904' W
L	59° 48.460' N	004° 00.000' W

Table G6: Co-ordinates of prohibited area (bottom trawl and seines)

Point	Latitude	Longitude
M	59° 30.016' N	004° 00.000' W
N	59° 16.185' N	005° 31.195' W
O	59° 19.051' N	005° 39.422' W
P	59° 19.960' N	005° 43.890' W
Q	59° 20.290' N	005° 49.837' W
R	59° 19.708' N	005° 56.502' W
S	59° 18.443' N	006° 01.946' W
T	59° 26.783' N	006° 05.802' W

Point	Latitude	Longitude
U	59° 30.007' N	006° 00.000' W
V	59° 21.778' N	005° 47.323' W
W	59° 32.630' N	005° 00.458' W
X	59° 40.001' N	005° 00.000' W
Y	59° 51.702' N	004° 24.904' W
Z	59° 50.821' N	004° 18.089' W
AA	59° 46.111' N	004° 29.323' W
AB	59° 30.578' N	004° 41.478' W
AC	59° 30.586' N	004° 52.947' W
AD	59° 25.209' N	004° 53.193' W
AE	59° 34.969' N	003° 59.986' W

The proposed measures in Table G6 only need to be implemented if the existing measures for the windsock area are removed by the revised technical conservation regulations which are in development.

51 Fleet activity in the West Shetland Shelf MPA

From 2009 – 2013 there has been no demersal mobile gear fisheries in the MPA. There is a significant pot fishery which has developed over the years that the windsock measures have been in place. In the reference period this amounted to 1035 hours effort per year on average.

52 Assessment of potential displacement effects

There will be no displacement caused by the proposed measures. They may cause an increase in gear conflict which would potentially occur upon revocation of the windsock measures anyway.

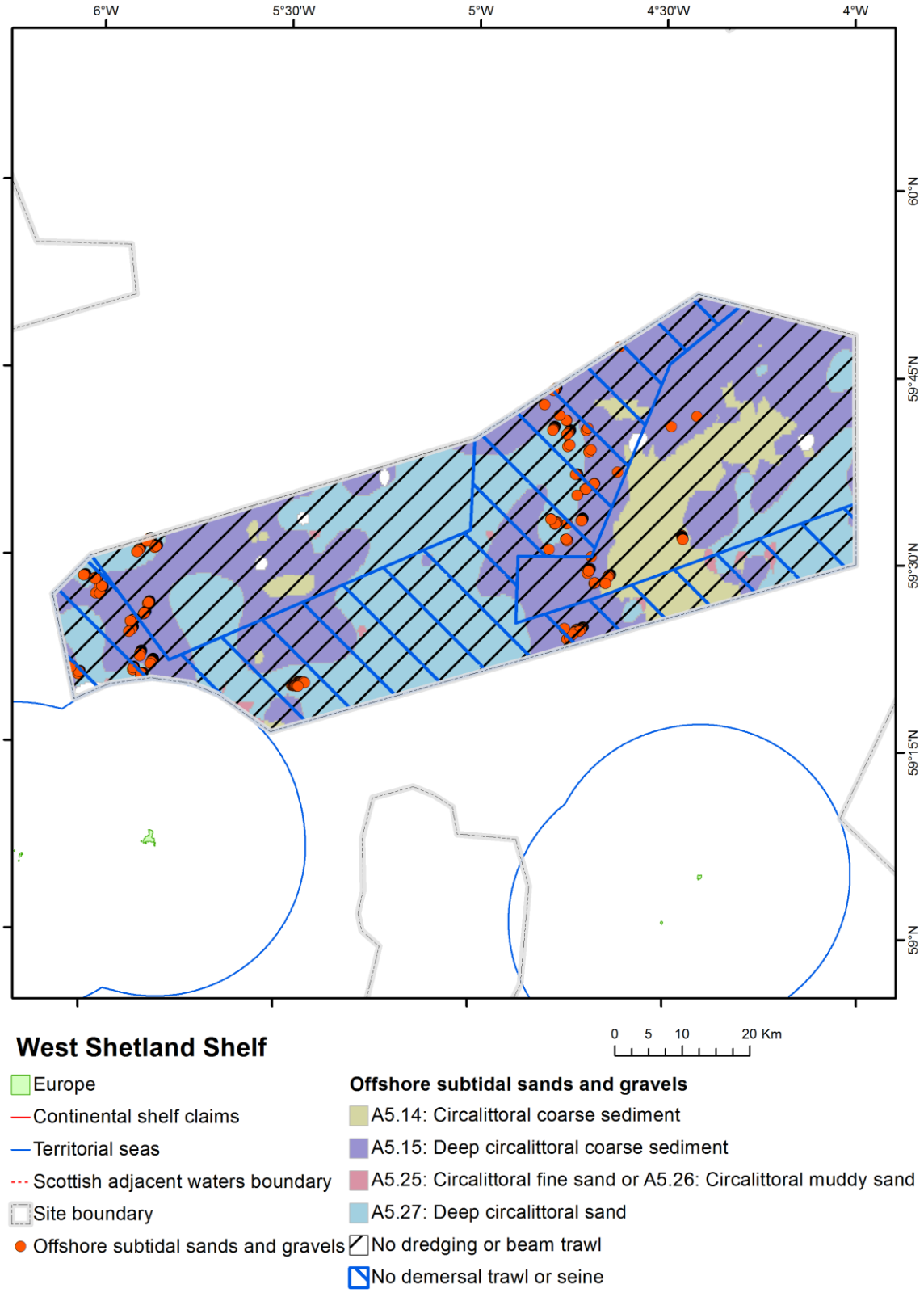


Figure G3: West Shetland Shelf map of proposed measures for demersal mobile gears.

Section H

53 Wyville-Thomson Ridge Special Area Of Conservation (SAC)

53.1 Site description

The Wyville-Thomson Ridge SAC is located approximately 150 km north west of Cape Wrath and extends in a north westerly direction towards the Faeroe Bank, as shown in Figures 2 and H1. The Ridge divides the warmer waters of the Rockall Trough from the cooler waters of the Faroe-Shetland Channel, and is a transitional area between the two water masses.

The Wyville-Thomson Ridge is approximately 20 km wide and 70 km long and rises from over 1000 m depth to less than 400 m at the summit. The ridge is composed of extensive areas of stony reef interspersed with gravel areas and bedrock reef along its flanks.

The stony reef is thought to have been formed by the ploughing movement of icebergs through the seabed at the end of the last ice age. These iceberg 'ploughmarks' consist of ridges of boulders, cobbles and gravel where finer sediments have been winnowed away by high energy currents at the site, interspersed with finer sediment troughs up to 10 m deep (Masson et al., 2000).

The bedrock and stony reef areas in the site support diverse biological communities representative of hard substrate in deep water, including a range of sponges; stylasterid, cup and soft corals; brachiopods; bryozoans; dense beds of feather stars and brittle stars; sea urchins, sea cucumbers and sea spiders (Masson et al., 2000; Brian Bett, pers comm., 2004; Henry & Roberts, 2004; Howell et al., 2007; Morris et al., 2014) (Figure H2). Communities on the bedrock reef vary in species composition between the two sides of the site due to the influences of different water masses on either side of the ridge (Howell et al., 2007).

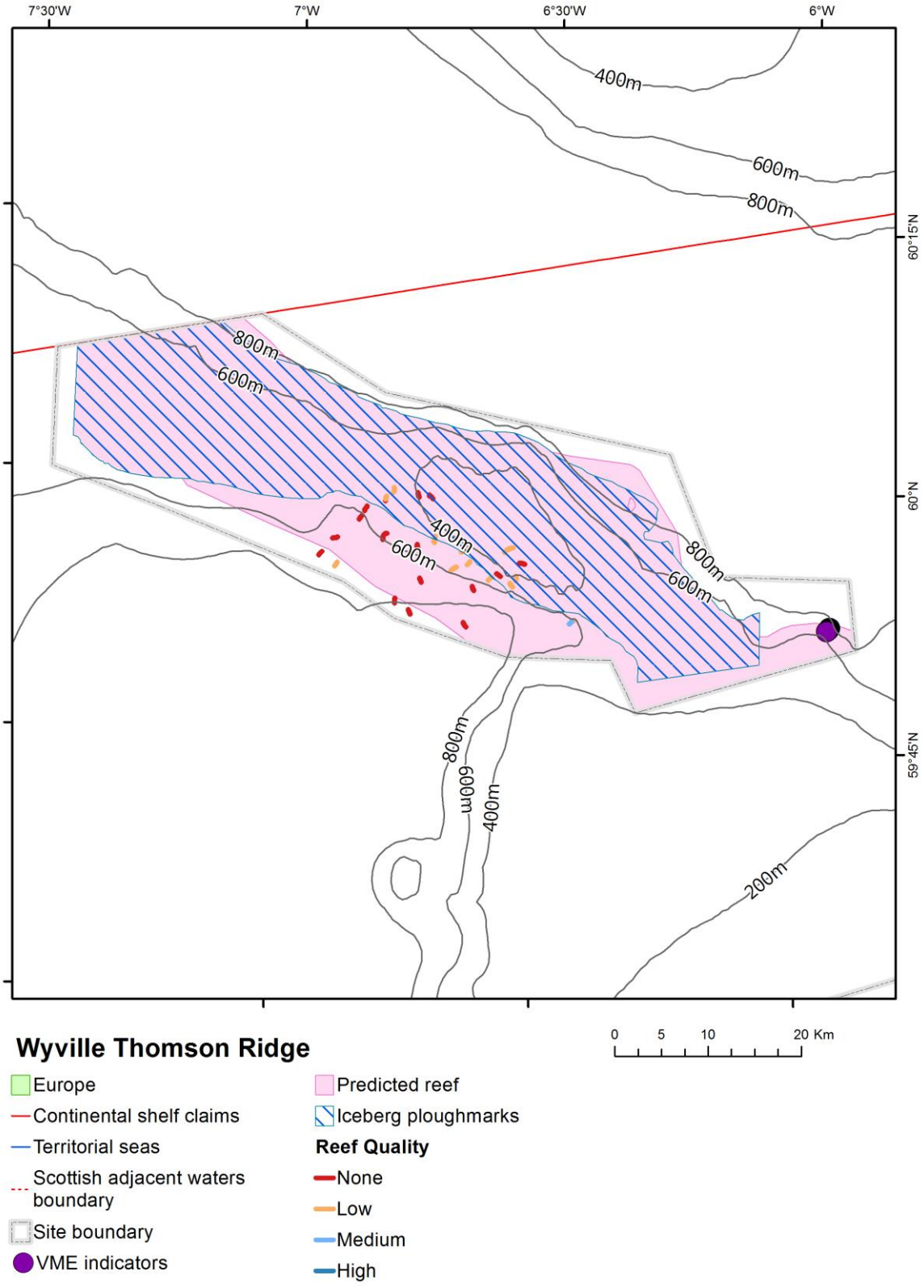


Figure H1: Wyville-Thomson Ridge SAC site map including distribution of features for which management measures are being proposed

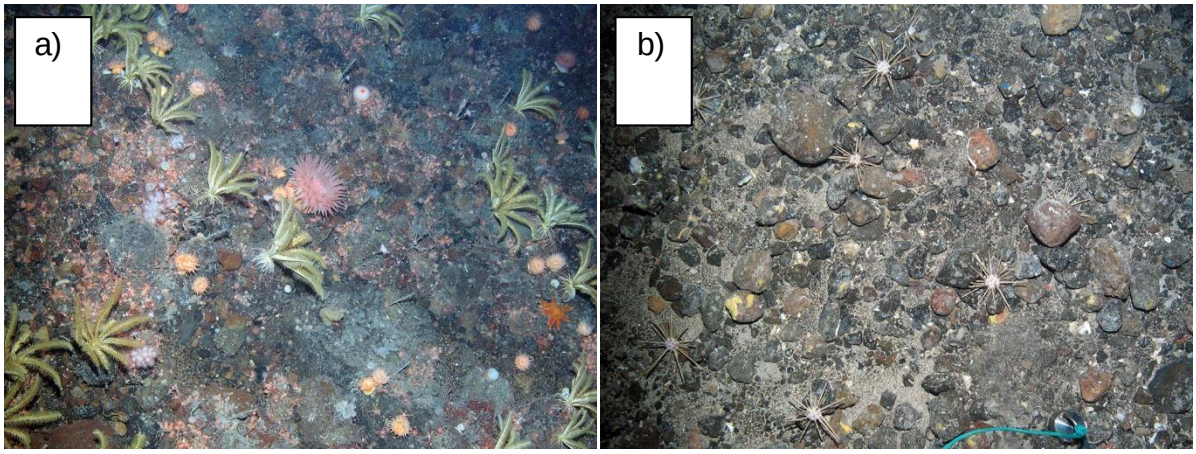


Figure H2: Feature images from Wyville Thomson Ridge (© JNCC, 2012) a) Annex I reef dominated by the northern feather star (*Heliometra glacialis*) and anthozoans including the sea anemone *Actinostola callosa* and others plus a soft coral (Nephtheidae) and small brittle stars (Ophiuroidea indet.); and b) Pencil slate sea uchins (*Cidaris cidaris*) on Annex I stony reef with encrusting sponges

53.2 Why the site was designated

This site represents full salinity stony and bedrock reef, subject to moderate/high energy levels and minimal coastal influence. The ridge is periodically exposed to hydrodynamic conditions associated with the Faroe-Shetland Channel (Borenäs et al., 2001) and this has led to the development of a unique reef habitat, with species composition varying either side of the ridge (Howell et al., 2007). The site therefore makes a contribution to the Natura 2000 network for Annex I reef (H1170).

The SAC is approximately 1,740 km^2 and it should be noted that iceberg ploughmarks are a mosaic habitat consisting of boulders and cobbles in the ploughmark ridges with finer sand in the troughs. The proportion of habitats is shown in figure H1 and based on the most recent survey data it is thought that the predicted stony reef may be an overestimate.

Table H1: Estimated area of protected feature within the SAC

Feature	Area of habitat[25] (km^2)
Area interpreted as iceberg ploughmarks	1019.85
Predicted stony reef	1397.98

53.3 The site boundary

The boundary for the Wyville-Thomson Ridge site was defined using the JNCC SAC boundary definition guidelines (JNCC, 2012a). The proposed boundary is a simple polygon which includes a buffer of 1,700m around the reef habitat. This is 2 times the maximum water depth of 850m.

53.4 Conservation objectives

Conservation objectives set out the desired quality of the protected features within each Natura 2000 site. The conservation objective for the Wyville-Thomson Ridge SAC is , subject to natural change, to restore the reef to favourable condition such that:

- the natural environmental quality is restored;
- the natural environmental processes are maintained;
- The extent, physical structure, diversity, community structure and typical species representative of stony and bedrock reef are restored

[25] These do not add up to the area of the site because they are overlapping

54 Anthropogenic pressures

54.1 All demersal mobile gear (including dredge, beam trawl, bottom trawl, and seines)

Whilst it is unlikely that demersal towed gears can affect the long-term natural distribution of bedrock and stony reef features, there is evidence to indicate that their use can impact the structure and function of the habitat and the long term survival of its associated species.

The use of towed fishing gears is likely to cause damage or death of fragile, erect species, such as sponges and corals (Freese et al. 1999; Løkkeborg 2005). Other species such as hydroids, anemones, bryozoans, tunicates and echinoderms may also be vulnerable (McConnaughey et al., 2000; Sewell & Hiscock, 2005). Where fragile, slow growing species occur, even low levels of fishing have the potential to change the structure and function of the habitats and may result in the loss of some characteristic species.

54.2 All demersal static gear (including gillnets, trammel nets, long lines, pots and traps)

Mechanical impacts of static gear (e.g. weights and anchors hitting the seabed, hauling gear over seabed, rubbing/entangling effects of ropes) can damage some species (Eno et al., 1996). Other species appear to be resilient to individual fishing operations but the effects of high fishing intensity are unknown (Eno et al., 2001). Recovery will be slow (Foden et al., 2010) resulting in significant reduction or even loss of characteristic species. The individual impact of a single fishing operation may be slight but cumulative damage may be significant (Eno et al., 2001; Foden et al., 2010).

54.3 Other human activities

Two active telecommunications cables cross the site, roughly from west to east. Exposure to physical loss from cables is therefore assessed as low.

55 Proposed fisheries management measures

This section provides details of how the measures were determined.

55.1 Options considered for fisheries management

Table H2 provides a summary of the management advice set out against the various options that have been considered.

Table H2: Summary of fisheries management advice

Activity	Management options considered
Demersal mobile gear	**No additional management:** There is a significant risk of not achieving the conservation objectives for the reef feature.
	Reduce/limit pressures: This option would reduce the risk of not achieving the conservation objectives for the reef feature. Appropriate management could include exclusion of mobile bottom contact gears over the main areas of bedrock and stony reef, allowing fishing to continue in fishable areas around the features. It is possible that these areas may include some areas where the distribution of reef is unknown or uncertain as well as small areas of known Annex I reef. As such , there would be a risk of localised impact to the structure and function of reef communities in these areas. The location of areas to be covered by management restrictions could include a buffer zone to reduce any risk of accidental contact with the feature. The location of areas to be covered by management restrictions would be decided in consultation with fishers.
	Remove/avoid pressures: This option would reduce the risk of degradation to any reef feature within the site boundary to the lowest possible levels. Restrictions would be required for all mobile bottom contact gears within the full extent of the site boundary. The site boundary already includes a buffer zone based on a ratio of 2:1 fishing warp length to depth around the known features to reduce any risk of accidental contact with the feature.
Demersal static gear	**No additional management:** This option is considered to be sufficient for bottom contacting static gear to achieve the conservation objectives for the reef feature. However, if monitoring showed evidence of detrimental effects as a result of static gear activity in the future, additional management may be required.
	Reduce/limit pressures: . Where VME indicator species have been identified, this option would remove the risk of not achieving the conservation objectives to the lowest possible level.

55.2 Proposed management option and rationale

Table H3 provides details of the chosen management approach and further explanation is provided below.

Table H3: Chosen management approach

Protected feature	Gear type	Option chosen	Approach to management
Stony and bedrock reef (H1170)	Demersal mobile gear	Remove / avoid pressure	Prohibit all demersal towed gear fisheries from a proportion of the site, including the area interpreted as iceberg ploughmarks.
	Demersal static gear		Prohibit activity only where VME indicator species have been found in the SAC

The management proposal is to prohibit demersal towed gears from a proportion of the SAC to protect Annex I reef, including areas where the extent of predicted reef layer overlaps with areas interpreted as iceberg ploughmarks. Proportions are shown in Table H4.

Iceberg ploughmarks are relict features that occur along the UK continental shelf edge off northern and western Scotland and provide patchy areas of hard substratum on the seabed in areas otherwise dominated by soft sediments. Iceberg plough-marks give rise to raised areas of cobbles and small boulders either side of a central furrow.

Additional measures for static demersal gear are proposed for an area where VME indicator species have been identified. Although this is only based on species record information, it provides evidence of the existence or potential for VME habitats in the area.

Table H4: Area of feature within the SAC protected from demersal mobile gear

Feature	Area of habitat (km^2)	Area of habitat covered by management measures (km^2)	% of habitat covered by management measures
Area interpreted as iceberg ploughmarks	1019.85	1019.85	100%
Predicted stony reef	1397.98	1085.60	77.7%

56 Measures envisaged for control, enforcement and compliance

56.1 Vessel Monitoring System

The frequency of data transmissions shall be of at least once every 60 minutes, for vessels with demersal mobile gear on board within the SAC.

56.2 Key provisions to include in EC Regulation

Table H5 provides details of the gear types to be prohibited by the measures and Table H6 provides co-ordinates of the area to which the measures should be applied to demersal mobile gear types. Table H7 provides co-ordinates of the area to which the measures should be applied to demersal static gear types. All of the co-ordinates are provided in WGS84 datum and the last co-ordinate joins back to the first in the table. All co-ordinates are joined by geodesic lines. The measures are shown on the map in figures H3 and H4.

Table H5: Demersal fishing gears to be prohibited

Gear types to be prohibited by the proposed measures	Habitat code	Gear code Annex XI in EU Regulation No. 404/2011	International standard Classification of Fishing Gears (ISSCFG)
Beam trawl	1170	TBB	TBB
Bottom trawl		OTB, OTT, PTB, TBN, TBS, TB	OTB, OTT, OT, PTB, TB
Seines		SDN, SSC, SX, SV	SB, SV, SDN, SSC, SPR, SX
Dredge		DRB	DRB, DRH
Gillnets and entangling nets		GN, GNC, GND, GNS, GTN, GTR	GEN, GN, GNC, GND, GNS, GTN, GTR
Hooks and lines		LHM, LHP, LL, LLD, LLS, LTL, LX	LHM, LHP, LLS, LLD, LL, LTL, LX
Pots and traps		FIX, FPO	FIX, FPO, FYK

Table H6: Co-ordinates of prohibited area 1 (dredge, beam trawl, bottom trawl, and seines)

Point	Latitude	Longitude
A	60° 06.878' N	007° 27.089' W
B	60° 07.533' N	007° 20.825' W
C	60° 07.944' N	007° 16.864' W
D	60° 08.560' N	007° 10.891' W
E	60° 08.982' N	007° 06.775' W
F	60° 09.295' N	007° 03.712' W
G	60° 05.000' N	006° 49.000' W
H	60° 02.000' N	006° 16.002' W
I	59° 55.000' N	006° 10.000' W
J	59° 55.000' N	005° 55.000' W
K	59° 51.000' N	005° 54.000' W
L	59° 51.952' N	005° 56.781' W
M	59° 51.649' N	005° 57.512' W
N	59° 52.137' N	005° 58.452' W
O	59° 51.196' N	006° 05.049' W
P	59° 50.001' N	006° 05.012' W
Q	59° 48.782' N	006° 18.868' W
R	59° 50.264' N	006° 19.392' W
S	59° 52.642' N	006° 25.869' W
T	59° 52.991' N	006° 33.055' W

Point	Latitude	Longitude
U	59° 55.281' N	006° 37.691' W
V	59° 59.230' N	006° 54.336' W
W	59° 58.394' N	006° 56.871' W
X	60° 00.000' N	007° 27.000' W

Table H7: Co-ordinates of prohibited area 2 (all demersal gears)

Point	Latitude	Longitude
Y	59° 52.137' N	005° 58.452' W
Z	59° 52.841' N	005° 57.261' W
AA	59° 52.560' N	005° 56.432' W
AB	59° 51.952' N	005° 56.781' W
AC	59° 51.649' N	005° 57.512' W

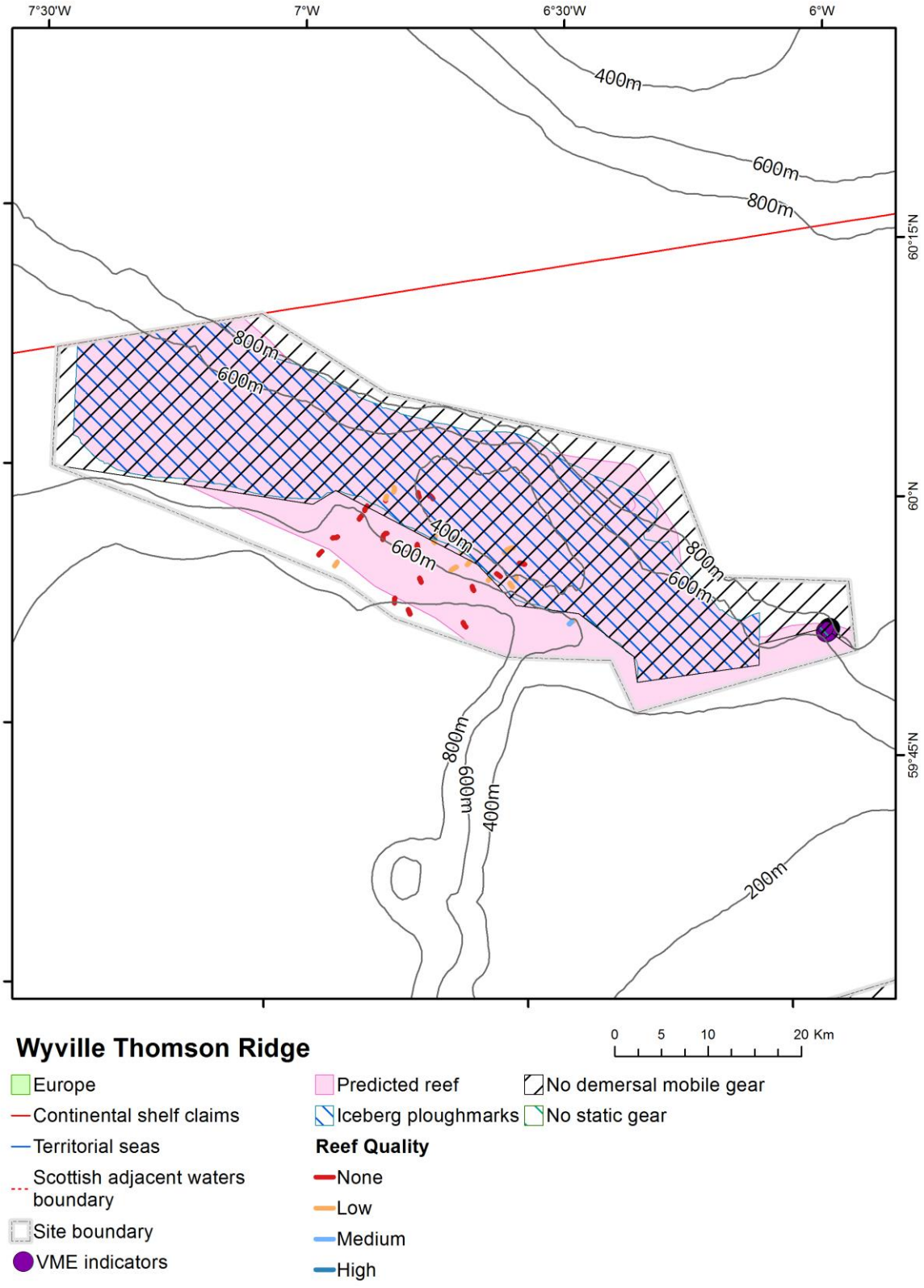


Figure H3: Wyville-Thomson Ridge SAC map of proposed measures

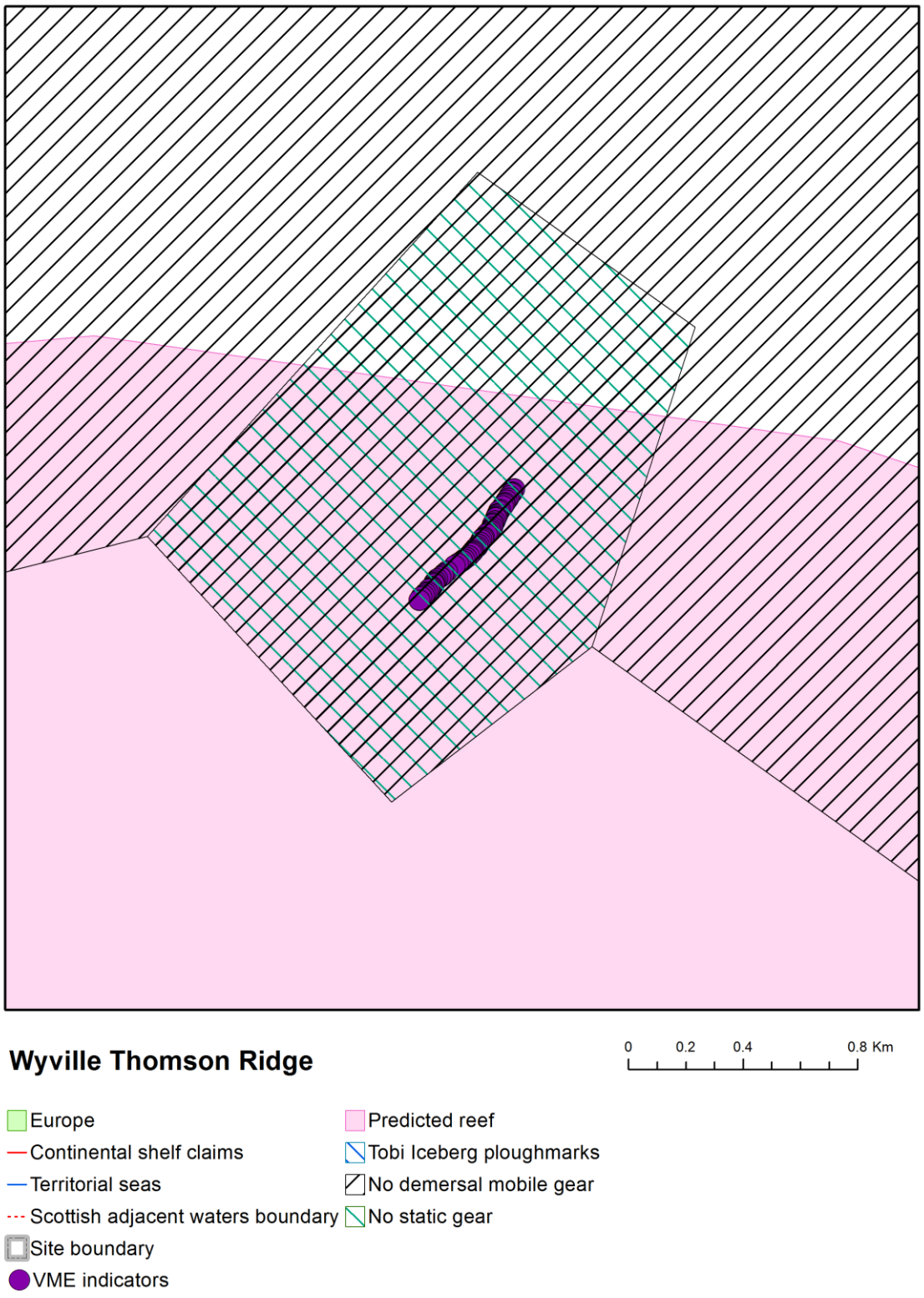


Figure H4: Wyville-Thomson Ridge SAC map of proposed static gear restriction.

57 Fleet activity in the Wyville-Thomson Ridge SAC

In this section the potential effect of the measures on fishing effort and value is estimated. These estimates are based on data from 2009 to 2013 using the methodology described in section 9.

57.1 Fishing effort

The management measures for this site apply to all demersal gears to varying degrees. Therefore table H8 shows effort in the relevant ICES rectangles for bottom trawl, and table H9 show long lines which are the only demersal gear types that have been in use in the reference period.

Table H8: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Wyville-Thomson Ridge SAC using bottom trawl

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
FRA	48E2	521	18	0
FRA	48E3	970	235	80
FRA	48E4	589	7	0
FRA	49E2	61	4	4
FRA	49E3	14	14	14
UK	48E3	305	8	6
UK	48E4	1745	2	0
UK	49E2	19	7	7
UK	49E3	18	18	18

Table H9: Average yearly effort (2009 – 2013) per ICES rectangle relevant to Wyville-Thomson Ridge SAC using long lines

Nation	Rectangle	Avg annual hours effort ICES rectangle	Of which avg annual hours effort site	Of which avg annual hours affected by management
ESP	48E3	591	96	0
ESP	49E3	7	7	0
FRA	48E3	120	30	0
UK	48E3	1318	429	0

57.2 Fishing value

Based upon the economic data provided by member states the value of the site, and the value of the management area can be derived. This is done by taking the proportion of the average for the relevant ICES rectangle based upon the amount of effort expended for each gear type in question. Table H10 show the average values derived for the reference period. This is depicted in Figures H4 to H6 through a kernel density estimation of Vessel Monitoring System data for demersal mobile gear, and H7 for demersal static gear.

Table H11: Estimated economic value of bottom trawl at Wyville-Thomson Ridge SAC (average of 2009 – 2013)[26]

Nation	Gear	Avg annual value in relevant ICES rectangles (Euro)	Avg annual value in SAC (Euro)	Of which avg value affected by management (Euro)
FRA	Bottom trawl	3,760,299	485,087	171,002
UK	Bottom trawl	1,963,444	64,892	60,496

58 Assessment of potential displacement effects

The level of displacement equates to 3% of bottom trawl effort in the relevant ICES rectangles which is derived from table H8 (129 hours out of 4242 hours). In overall terms this is a relatively low amount of displacement which could be absorbed by other fishing grounds in the relevant ICES rectangles.

[26] No economic data has been provided by Spain

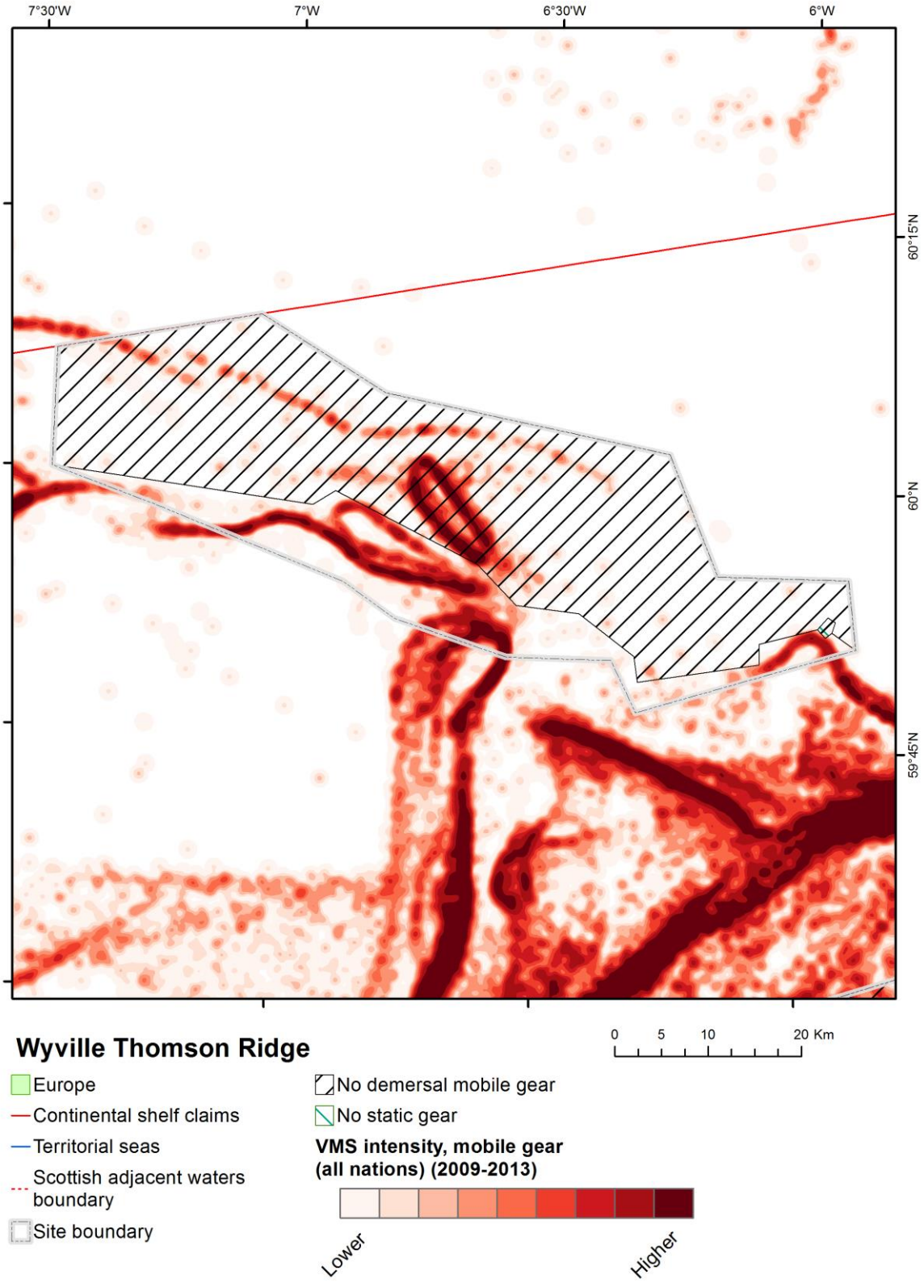


Figure H4: Wyville-Thomson Ridge SAC map of proposed measures with mobile fishing VMS intensity layer for all vessels 2009-13

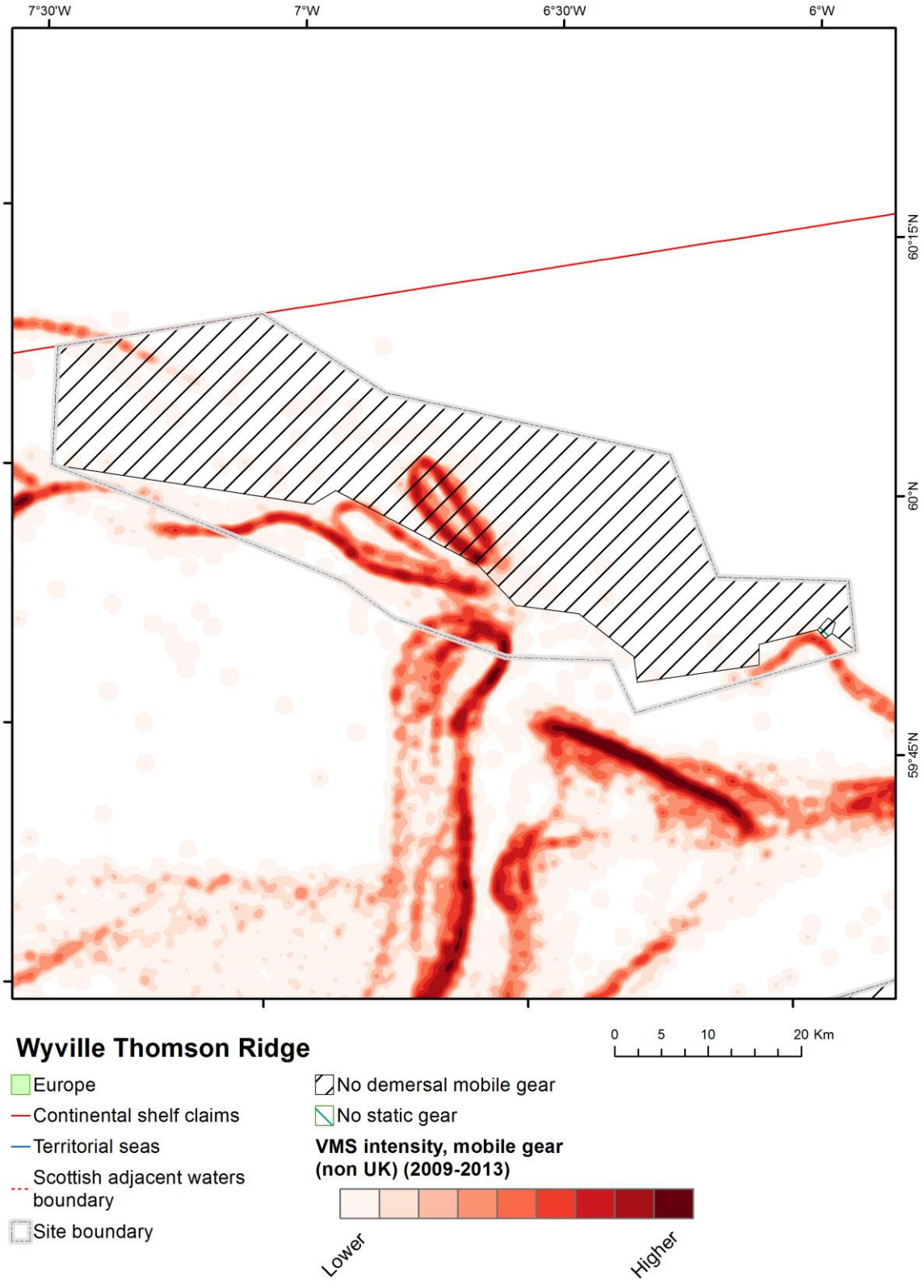


Figure H5: Wyville-Thomson Ridge SAC map of proposed measures with mobile fishing VMS intensity layer for non-UK European Union vessels 2009-13

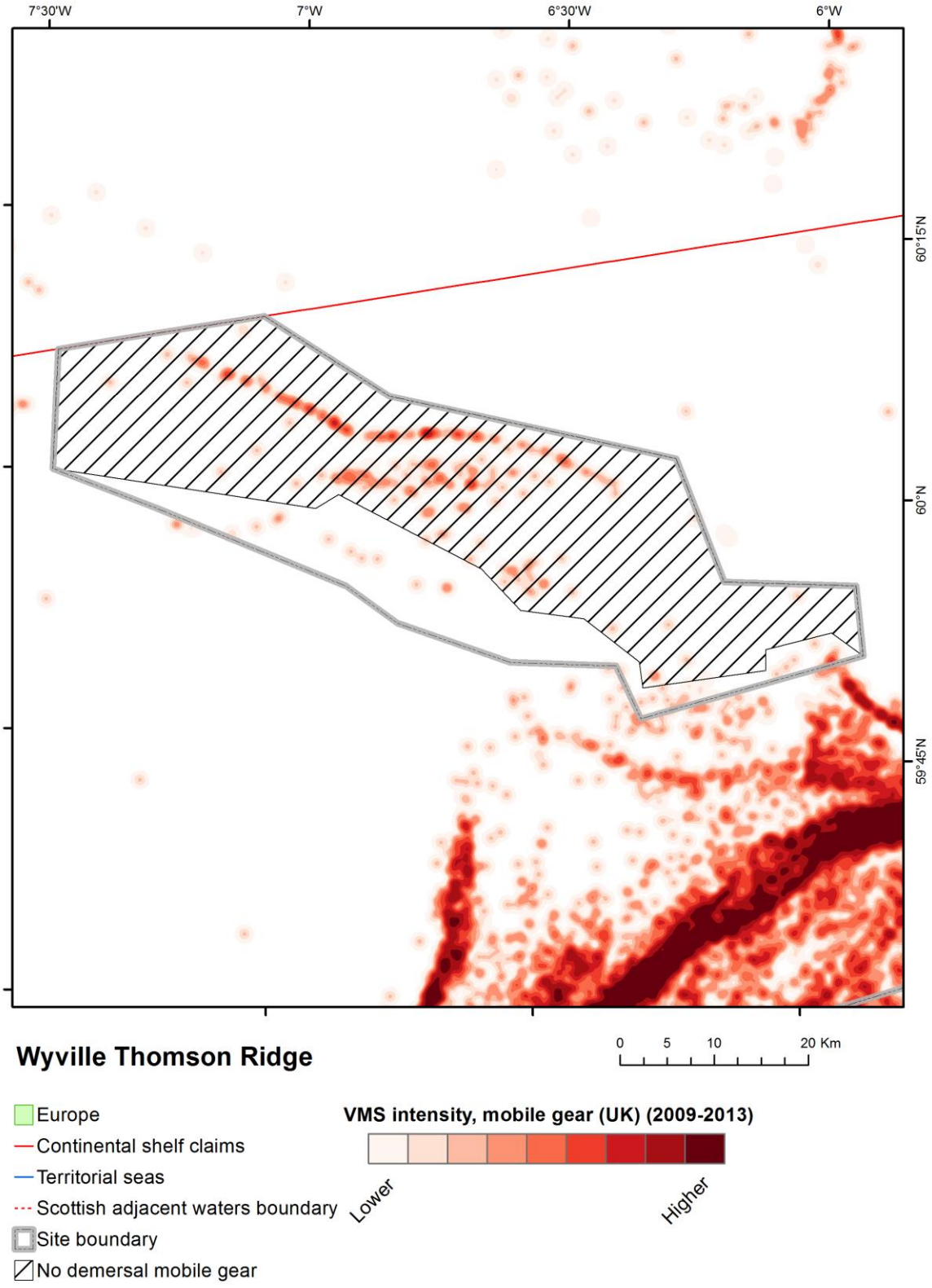


Figure H6: Wyville-Thomson Ridge SAC map of proposed measures with mobile fishing VMS intensity layer for UK vessels 2009-13

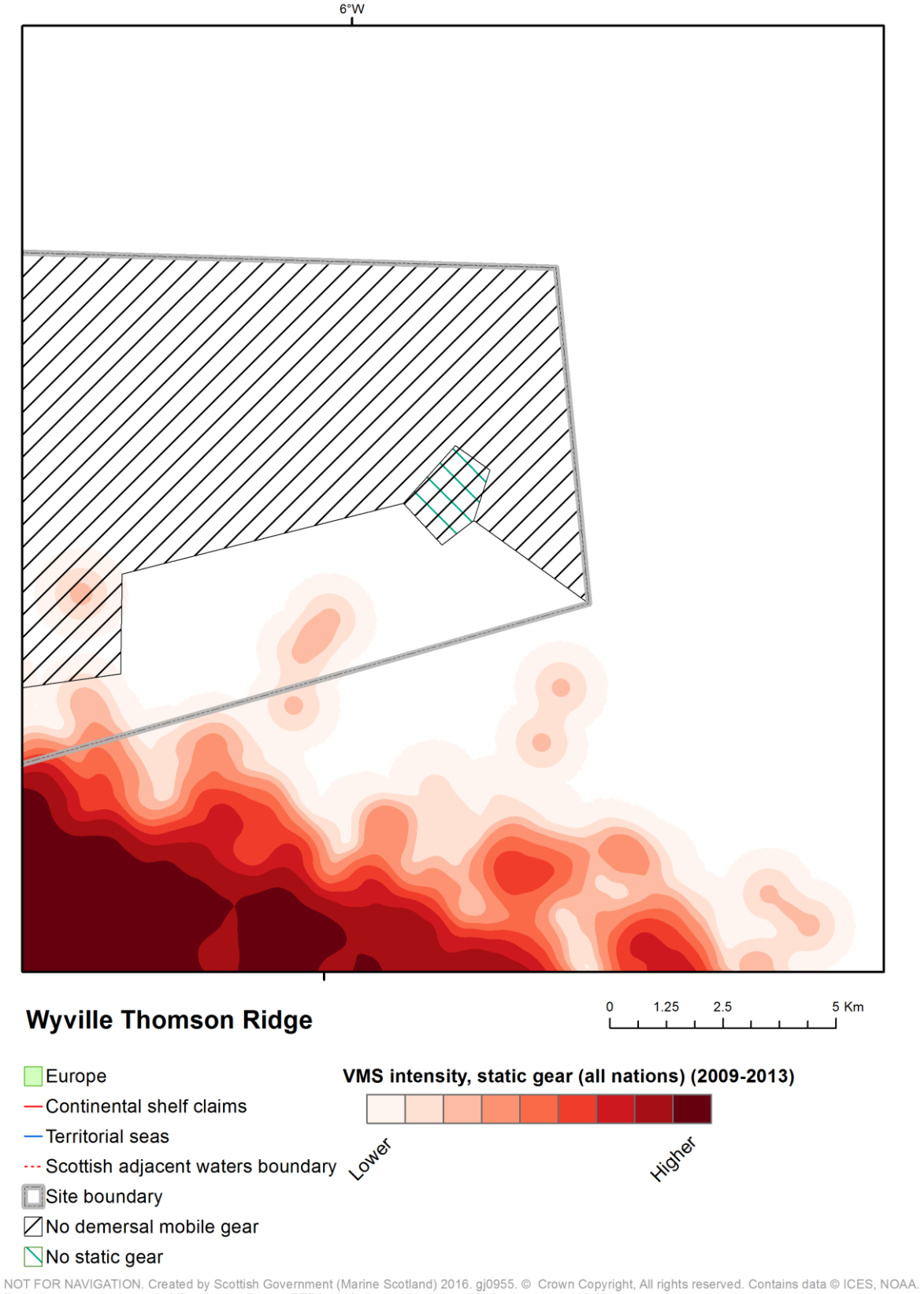


Figure H7: Wyville-Thomson Ridge SAC map of proposed measures for demersal static gears with static fishing VMS intensity layer for all vessels 2009-13

59 Appropriate Assessment

The management proposal for this site does not provide 100% protection of the reef habitat. Therefore an Appropriate Assessment in accordance with Article 6(3) of the EU Habitats Directive has been undertaken.

59.1 Fishing activity

This is described in this document at section 57 and in figures H4 – H7.

The management proposal is described in sections 65 and 66, with the proposed management measures shown in Figures H3 and H4. Table H4 provides details of the reef subtypes present within the SAC, and the proportion of each that would be protected by the management measures. In this case, although all of the potential Annex I reef overlapping with the predicted Iceberg ploughmark extent is protected this is not the case for areas of potential Annex I stony reef outside the predicted ploughmark area.

59.2 Requirements of the EU Habitats Directive

Article 6(3) of the Habitats Directive contains the condition that "Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives"

Continuation of commercial fishing activity potentially overlapping the Annex I feature of the SAC is not considered necessary to the management of the site. Therefore, there is an obligation to apply the Likely Significant Effect test.

59.3 Test of Likely Significant Effect

A review of available sensitivity information was conducted to assess whether the proposed activities are likely to have a significant effect on the Annex I Reef within the Wyville-Thomson Ridge SAC.

59.3.1 Sensitivity of Wyville-Thomson Ridge SAC habitats to pressures associated with mobile fishing gear

According to JNCC Conservation Objectives and Advice on Operations (JNCC, 2012), the ongoing mobile demersal fishing activities (otter trawling) are associated with the following pressures at The Wyville Thomson Ridge:

- Physical damage through physical disturbance or abrasion

59.3.2 Sensitivity assessment for Wyville-Thomson Ridge SAC

JNCC advice on Conservation Objectives and operations provides a generic sensitivity assessment for the features of the The Wyville Thomson Ridge SCI. This assessment has been drawn principally from MarLIN's evaluation of the following biotope:

'*Eunicella verrucosa* and *Pentapora foliacea* on wave-exposed circalittoral rock (CR.HCR.XFa.ByErSp.Eun)'

It should be noted that this biotope is not identical to the habitats present within the MPA, but was considered the closest match for which a MarLIN sensitivity assessment was available and comparable in terms of functionality.

The JNCC overall sensitivity assessment for the pressures associated with the proposed trawling activities is presented below:

Physical damage through physical disturbance or abrasion

Physical abrasion (for example, by mobile fishing gear) can damage the interest feature and its typical species. Physical abrasion is likely to reduce the structural complexity of the feature (for example, by damaging erect epifaunal species such as *Alcyonium digitatum*, Axinellid sponges, massive sponges and cold water coral) and reduce biodiversity through the selective removal of large, sessile, long-lived species from the community (Sewell and Hiscock, 2005). Many of the feature's typical species are permanently attached to the substratum and will not re-attach once displaced. Sensitivity to physical disturbance and abrasion is therefore assessed as high.

59.3.3 Likely Significant Effect test conclusion

Taking the available sensitivity information into account and the potential impact of mobile demersal gears, it is considered that the proposed operations could have a likely significant effect on the Annex I features of the sites. An Appropriate Assessment of the risks that on-going fishing activities may pose to the features of the sites is presented below.

59.4 Appropriate Assessment of risk to Annex I reef habitat

The ridge is composed of extensive areas of stony reef interspersed with gravel areas and bedrock reef along its flanks. The stony reef is thought to have been formed by the ploughing movement of icebergs through the seabed at the end of the last ice age. These iceberg 'ploughmarks' consist of ridges of boulders, cobbles and gravel where finer sediments have been winnowed away by high energy currents at the site, interspersed with finer sediment troughs up to 10 m deep (Masson et al. 2000). The extent of iceberg ploughmarks within the SCI (Figure H1) have been interpreted by the National Oceanography Centre from Towed Ocean Bottom Instrument (TOBI) surveys conducted by DECC in 1996.

The bedrock and stony reef areas in the site support diverse biological communities representative of hard substrate in deep water, including a range of sponges; stylasterid, cup and soft corals; brachiopods; bryozoans; dense beds of featherstars and brittlestars; sea urchins, sea cucumbers and sea spiders (Masson et al, 2000; Henry & Roberts, 2004; Howell et al. 2007; Brian Bett, pers comm., 2004 and Morris et al., 2014). Communities on the bedrock reef vary in species composition between the two sides of the site due to the influences of different water masses on either side of the ridge (Howell et al., 2007).

Physical damage through physical disturbance or abrasion

Rocky habitats can vary in their hardness and therefore resistance to damage from towed demersal gears, however, harder examples of the substrate (e.g. metamorphic rocks) are typically more resistant to damage than softer examples. (e.g. shales and chalk).

Towing fishing gear across rocky substrates is likely to cause damage or death of attached species and reduce habitat complexity as boulders and cobbles associated with the hard substrate are moved around. Recovery times for impacted habitat are likely to be longer than for softer sediments' although the current management proposal for The Wyville-Thomson Ridge SAC ensures the protection from mobile demersal gears at least 77% of the reef feature, therefore the risk of not achieving the conservation objectives is reduced. More recent survey data which is shown in figure H1 is likely to reduce the estimate of predicted stony reef at this site.

59.5 Mitigation measures

No additional mitigation measures are being considered in this assessment.

59.6 Conclusion of site integrity test

Marine Scotland consider that the proposed operations would not represent an adverse effect on the site integrity of Wyville-Thomson Ridge SAC, primarily because;

There is no risk of reduction in reef extent from ongoing fishing activities

There is 100% protection of the iceberg ploughmark habitat and overlapping the known record of a VME indicator species within the site.

In 2009 to 2013 the parts of the SAC that would remain exposed to potential mobile gear fishing pressure were only fished for an average of 184 hours per year (derived from Table H8). This is the equivalent of just over 1 week of fishing pressure per year.

Continuation of activities may result in a temporary loss of amenity but it is expected that any effects would be reversible and recovery is likely in the longer term (Kaiser et al., 2006)

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