European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the habitat:

H1170 - Reefs

SCOTLAND

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this habitat, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this habitat is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was only relevant at UK-level (sections 10 Future prospects and 11 Conclusions).
- For technical reasons, the country-level future trends for Range, Area covered by habitat and Structure and functions are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (Scotland information only)**
1.2 Habitat code	**1170 - Reefs**

2. Maps

2.1 Year or period	
2.3 Distribution map	Yes
2.3 Distribution map Method used	
2.4 Additional maps	No

BIOGEOGRAPHICAL LEVEL

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs	**Marine Atlantic (MATL)**
3.2 Sources of information	Baxter, J.M., Boyd, I.L., Cox, M., Donald, A.E., Malcolm, S.J., Miles, H., Miller, B., Moffat, C.F., Editors. (2011).Scotland's Marine Atlas: information for the national marine plan. Marine Scotland, Edinburgh. Available from: http://www.gov.scot/Topics/marine/science/atlas Howson, C.M., Mercer, T. and Moore, J.J. (2006). Site Condition Monitoring: survey of rocky reefs in the Firth of Lorn marine Special Area of Conservation. Scottish Natural Heritage Commissioned Report No. 190. (ROAME No. F05AC701). Dornoch Firth SAC Site Condition Monitoring Report. 2004. Unpublished report. Munro, C. and Nunny, R. 2000. Broad scale survey and mapping of the seabed and shore habitats and biota: Dornoch Firth pSAC. Scottish Natural Heritage Commissioned Report F97PA02. Moore et al.(2009). The establishment of site condition monitoring of the rocky reefs of the Isle of May Special Area of Conservation. SNH Commissioned Report No. 301 (ROAME No. RC07AC705) CD/DVD 223 Moore, C.G., Saunders, G.R., Harries, D.B., Mair, J.M., Bates C.R., and Lyndon, A.R. (2006). The establishment of site condition monitoring of the subtidal reefs of Loch Creran Special Area of Conservation. Scottish Natural Heritage Commissioned Report No. 151 (ROAME No. F02AA409). Moore, C.G., Saunders, G., Mair, J.M. and Lyndon, A.R. (2006). The inauguration of site condition monitoring of marine features of Loch Maddy Special Area of Conservation. Scottish Natural Heritage Commissioned Report No. 152 (ROAME No. F02AA409). Moore, C.G., Harries, D.B., Lyndon, A.R., Mair, J.M., Tulbure, K.W., Saunders, G.R, Grieve, R. & Brash, J. 2016. 2015 site condition monitoring and site check surveys of marine sedimentary and reef habitats in the Loch nam Madadh SAC, Loch nam Madadh SSSI and Loch an Duin SSSI. Scottish Natural Heritage Commissioned Report No. 923. Moore, C.G., Cook, R.L., Porter, J.S., Sanderson, W.G., Want, A., Ware, F.J., Howson, C., Kamphausen, L. & Harries, D.B. 2017. 2015 site condition monitoring of marine sedimentary and reef habitats in Loch Laxford SAC. Scottish Natural Heritage Commissioned Report No. 943. Marine Scotland 2015. Scotland's National Marine Plan. http://www.gov.scot/Resource/0047/00475466.pdf

Marine Scotland. 2016. MPA Management - fisheries management - details of orders in place http://www.gov.scot/Topics/marine/marine-environment/mpanetwork/MPAMGT/protectedareasmgt
Emu Ltd. 2006. Site Condition Monitoring: surveys of biogenic and rocky reefs in the Lochs Duich, Long and Alsh cSAC. Scottish Natural Heritage Commissioned Report No. 240
Marine Bio-images. 2007. Repeat monitoring of the unfavourable-declining Modiolus biogenci reef features of the Lochs Duich, Long and Alsh SAC. Scottish Natural Heritage Commissioned Report No. 297.
Harries, D.B., Moore, C.G., Lyndon, A.R., and Mair, J.M. 2009. The establishment of site condition monitoring of the rocky reefs and sea caves of Mousa Special Area of Conservation. Scottish Natural Heritage Commissioned Report No. 326.
Axelsson, M., Dewey, S., and Doran, J. 2010. Broad scale mapping of the North Rona Special Area of Conservation (SAC). Scottish Natural Heritage Commissioned Report No. 386.
Scottish Natural Heritage. 2008. The establishment of site condition monitoring of the marine features of the Sanday Special Area of Conservation.
Posford Duvivier Environment. 2000. Broad scale survey and mapping of the seabed and shore habitats and biota: St Kilda cSAC - SNH CR No F97PA01
Mercer, T., Howson, C.M., and Moore, J.J. 2007. Site condition monitoring: Loch Sunart marine SAC and SSSI. Scottish Natural Heritage Commissioned Report No. 286.
Moore, C.G., Edwards, D.C.B., Harries D.B., and Mair, J.M. 2009. The establishment of site condition monitoring of the rocky reefs of the Treshnish Isles Special Area of Conservation. Scottish Natural Heritage Commissioned Report No. 302.
Mair, J.M., Lyndon, A.R., Moore, C.G., and Sotheran, I.S. Site Condition Monitorng of the Sullom Voe Special Area of Conservation. Scottish Natural Heritage Commissioned Report No. 350.
Small Isles MPA - https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/national-designations/marine-protected-areas/nature-conservation-12
Fetlar to Haroldswick MPA - https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/national-designations/marine-protected-areas/nature-conservation-15
Noss Head MPA -https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/national-designations/marine-protected-areas/nature-conservation-10
Upper Loch Fyne and Loch Goil MPA - https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/national-designations/marine-protected-areas/nature-conservation-14
ERT(Scotland) Ltd. 2005. Site condition montioring: surveysof marine rocky environments in the Papa Stour cSAC July-August 2003. Scottish Natural Heritage Commissioned Report No 102.
Gormley, K.S.G., Porter, J.S., Bell. M.C., Hull, A.S., and Sanderson, W.G. 2013. Predictive habitat modelling as a tool to assess the change in distribution and extent of an OSPAR priority habitat under increasing ocean temperature scenario: consequences for Marine Protected Area networks and management. PLoS ONE, 8(7), e68263
Marine Scotland Consultation Webpage for Priority Marine Feature Consultation https://consult.gov.scot/marine-scotland/priority-marine-features

4. Range

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

4.1 Surface area (in km²)	12203.95391		
4.2 Short-term trend Period			
4.3 Short-term trend Direction			
4.4 Short-term trend Magnitude	a) Minimum	b) Maximum	
4.5 Short-term trend Method used			
4.6 Long-term trend Period			
4.7 Long-term trend Direction			
4.8 Long-term trend Magnitude	a) Minimum	b) Maximum	
4.9 Long-term trend Method used			
4.10 Favourable reference range	a) Area (km²) b) Operator c) Unknown No d) Method		
4.11 Change and reason for change in surface area of range	No change The change is mainly due to:		
4.12 Additional information			

5. Area covered by habitat

5.1 Year or period			
5.2 Surface area (in km²)	a) Minimum 12203.954	b) Maximum 12203.954	c) Best single value 12203.95391
5.3 Type of estimate			
5.4 Surface area Method used			
5.5 Short-term trend Period			
5.6 Short-term trend Direction			
5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.8 Short-term trend Method used			
5.9 Long-term trend Period			
5.10 Long-term trend Direction			
5.11 Long-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.12 Long-term trend Method used			
5.13 Favourable reference area	a) Area (km²) b) Operator c) Unknown No d) Method		
5.14 Change and reason for change in surface area of range	No change The change is mainly due to:		
5.15 Additional information			

6. Structure and functions

6.1 Condition of habitat	a) Area in good condition (km²)	Minimum 11997.204	Maximum 11997.204
	b) Area in not-good condition (km²)	Minimum 206.75	Maximum 206.75

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

	c) Area where condition is not known (km²)	Minimum 0	Maximum 0
6.2 Condition of habitat Method used	Based mainly on extrapolation from a limited amount of data		
6.3 Short-term trend of habitat area in good condition Period	2007-2018		
6.4 Short-term trend of habitat area in good condition Direction	Stable (0)		
6.5 Short-term trend of habitat area in good condition Method used	Based mainly on extrapolation from a limited amount of data		
6.6 Typical species	Has the list of typical species changed in comparison to the previous reporting period?	No	
6.7 Typical species Method used			
6.8 Additional information			

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01)	H
Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03)	H
Marine aquaculture generating marine pollution (G16)	M
Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08)	M
Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03)	M
Other invasive alien species (other then species of Union concern) (I02)	M
Transmission of electricity and communications (cables) (D06)	M
Mixed source marine water pollution (marine and coastal) (J02)	M

Threat	Ranking
Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01)	M
Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03)	M
Marine aquaculture generating marine pollution (G16)	M

Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08)	M
Other invasive alien species (other then species of Union concern) (I02)	M
Transmission of electricity and communications (cables) (D06)	M
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M
Change of habitat location, size, and / or quality due to climate change (N05)	M
Mixed source marine water pollution (marine and coastal) (J02)	M

7.2 Sources of information

7.3 Additional information

8. Conservation measures

8.1 Status of measures	a) Are measures needed?	Yes
	b) Indicate the status of measures	Measures identified and taken
8.2 Main purpose of the measures taken		Maintain the current range, population and/or habitat for the species
8.3 Location of the measures taken		Both inside and outside Natura 2000
8.4 Response to the measures		Medium-term results (within the next two reporting periods, 2019-2030)
8.5 List of main conservation measures		

Management of professional/commercial fishing (including shellfish and seaweed harvesting) (CG01)
Reduce/eliminate marine pollution from marine aquaculture (CG08)
Adapt/manage exploitation of energy resources (CC02)
Reduce impact of transport operation and infrastructure (CE01)
Manage changes in hydrological and coastal systems and regimes for construction and development (CF10)
Other measures to reduce impacts from marine aquaculture infrastructures and operation (CG09)
Manage/reduce/eliminate point pollution to surface or ground waters from resource exploitation and energy production (CC08)

8.6 Additional information

Conservation measures operating now and into the future
For SACs conservation objectives, information on pressures and threats, and details of the habitats and species are contained within the Regulation 33 packages. For Nature Conservation MPAs site Conservation Objectives are provided in the Designation Orders from 2014 and threats, pressures and associated management measures have been identified in Management Options Papers published in 2013.
For SACs licensable activities e.g. aquaculture, renewable developments, oil and gas exploration and development, coastal developments, activitie associated with shipping/vessels e.g. dredging, anchorage, moorings military activities are subject to Habitiats Regulations Appraisal in Scotland which considers whether a

particular plan or project (activities) will cause a likely significant effect on the habitat and result in an adverse effect on site integrity. If the tests of the HRA are not met then the development normally will not be allowed to continue unless suitable mitigation can be undertaken. For Nature Conservation MPAs a Section 83 assessment is undertaken of the licensable activities, which requires the public authority to assess whether there is a significant risk of the activity hindering the achievement of the conservation objectives of the Nature Conservation MPA.
Fisheries orders have been put in place for the following sites as of 2016 which protect the Reefs of the sites (and other features where appropriate) from fishing methods to which they are sensitive (mainly mobile fishing gear e.g. dredging): Loch Creran SAC, East Mingulay SAC, Firth of Lorn SAC, Loch Laxford SAC, Sunart SAC, Lochs Duich Long and Alsh SAC, Luce Bay and Sands SAC, Sanday SAC, St Kilda SAC, Treshnish SAC, Noss Head MPA and Upper Loch Fyne and Loch Goil MPA . Measures for Berwickshire and North Northumberland SAC were already in place and are considered sufficient to protecte the Reef.
Outside of MPAs impacts are considered on Priority Marine Features (PMFs) (https://www.snh.scot/professional-advice/safeguarding-protected-areas-and-species/priority-marine-features-scotlands-seas) , of which there are some, e.g.horse mussel beds, northern sea fan and sponge communities, blue mussel beds, cold water coral reefs, t that could be considered as Annex I Reef habitat, and they are considered through Environmental Impact Assessments. Policy GEN 9 Natural Heritage in Scotland's National Marine Plan (Marine Scotland 2015) requires that development and use of the marine environment must not result in a significant impact on the national status of PMFs, including these habitats. Regional Marine Management Plans for some regions (Shetland, Clyde) have been developed which seek to identify the location of sensitive PMFs including some associated with Reef habitas and propose regional marine management policies to limit impacts of activities on these features and site development in more appropriate places.
Conservation measures which will start to operate during the next reporting period.
Fisheries management measures for gear that the habitat is sensitive to will be consulted on in 2018 with an aim to implement these in 2019. These are the remaining SACs and NC MPAs that don't already have adequate management in place and thus this will complete the fisheries management measures required for this habitat within MPAs in Scotland: Dornoch Firth and Morrich More SAC, Isle of May SAC, Loch nam Madadh SAC, Mousa SAC, North Rona SAC, Papa Stour SAC, Solway Firth SAC, Sound of Barra SAC, Sullom Voe SAC, Fetlar to Haroldswick MPA, and Small Isles MPA.
Currently underway (as of July 2018) is a consultation lead by Marine Scotland to consider where there is a need to consider additional management for bottom contacting mobile fishing gears to ensure there is no significant impact on the national status of the most sensitive habitat PMFs within the 6 nautical mile (NM) limit. This specifically deals with the location of these sensitive habitats outside of Marine Protected Areas including SACs. See https://consult.gov.scot/marine-scotland/priority-marine-features/
Some of the feature being considered are found within LSIB e.g. maerl beds, seagrass beds, maerl or coarse shell gravel with burrowing sea cucumbers, blue mussel beds. Therefore if measures go ahead to protect these features outside of the current MPAs in Scotland then this could offer additional protected to some locations within other LSIB outside the MPAs.
Regional Marine Management Plans will continue to be developed for other

regions with Orkney and the Outer Hebrides being proposed for during the next reporting period. As outlined above these will seek to identify the location of sensitive PMFs including some associated with subtidal sandbanks, and propose regional marine management policies to limit impacts of activities on these features and site development in more appropriate places.

9. Future prospects

9.1 Future prospects of parameters	a) Range b) Area c) Structure and functions
9.2 Additional information	

10. Conclusions

10.1. Range	
10.2. Area	
10.3. Specific structure and functions (incl. typical species)	
10.4. Future prospects	
10.5 Overall assessment of Conservation Status	
10.6 Overall trend in Conservation Status	
10.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to: b) Overall trend in conservation status No change The change is mainly due to:
10.8 Additional information	

11. Natura 2000 (pSCIs, SCIs, SACs) coverage for Annex I habitat types

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region)	a) Minimum	2165
	b) Maximum	2165
	c) Best single value	2165
11.2 Type of estimate	Best estimate	
11.3 Surface area of the habitat type inside the network Method used	Based mainly on extrapolation from a limited amount of data	
11.4 Short-term trend of habitat area in good condition within the network Direction	Stable (0)	
11.5 Short-term trend of habitat area in good condition within network Method used	Based mainly on extrapolation from a limited amount of data	
11.6 Additional information		

Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

12. Complementary information

12.1 Justification of % thresholds for trends

12.2 Other relevant information

Distribution Map

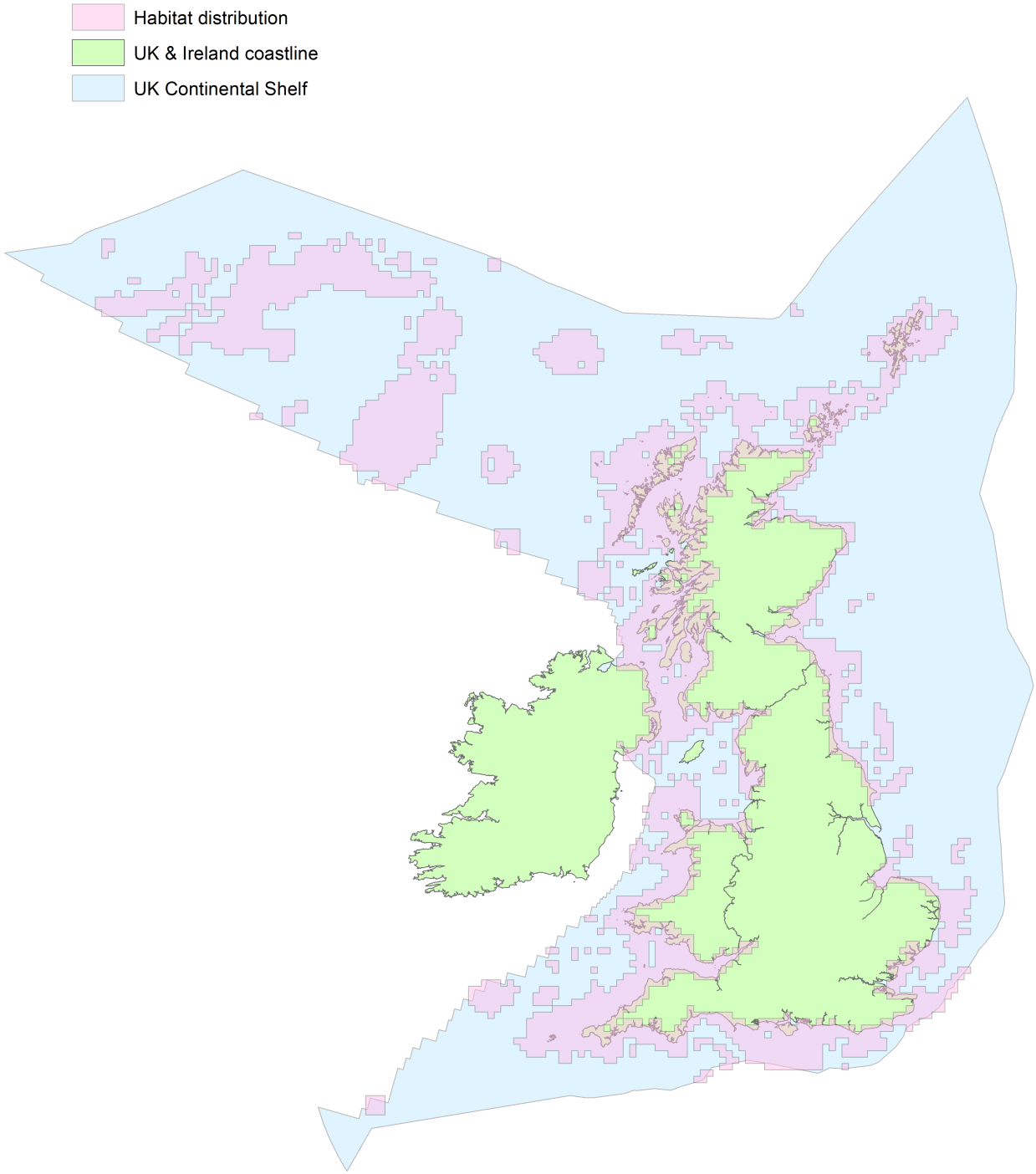

Figure 1: UK distribution map for H1170 - Reefs.

The 10km grid square distribution map is based on available habitat records which are considered to be representative of the distribution within the current reporting period. For further details see the 2019 Article17 UK Approach document.

Range Map

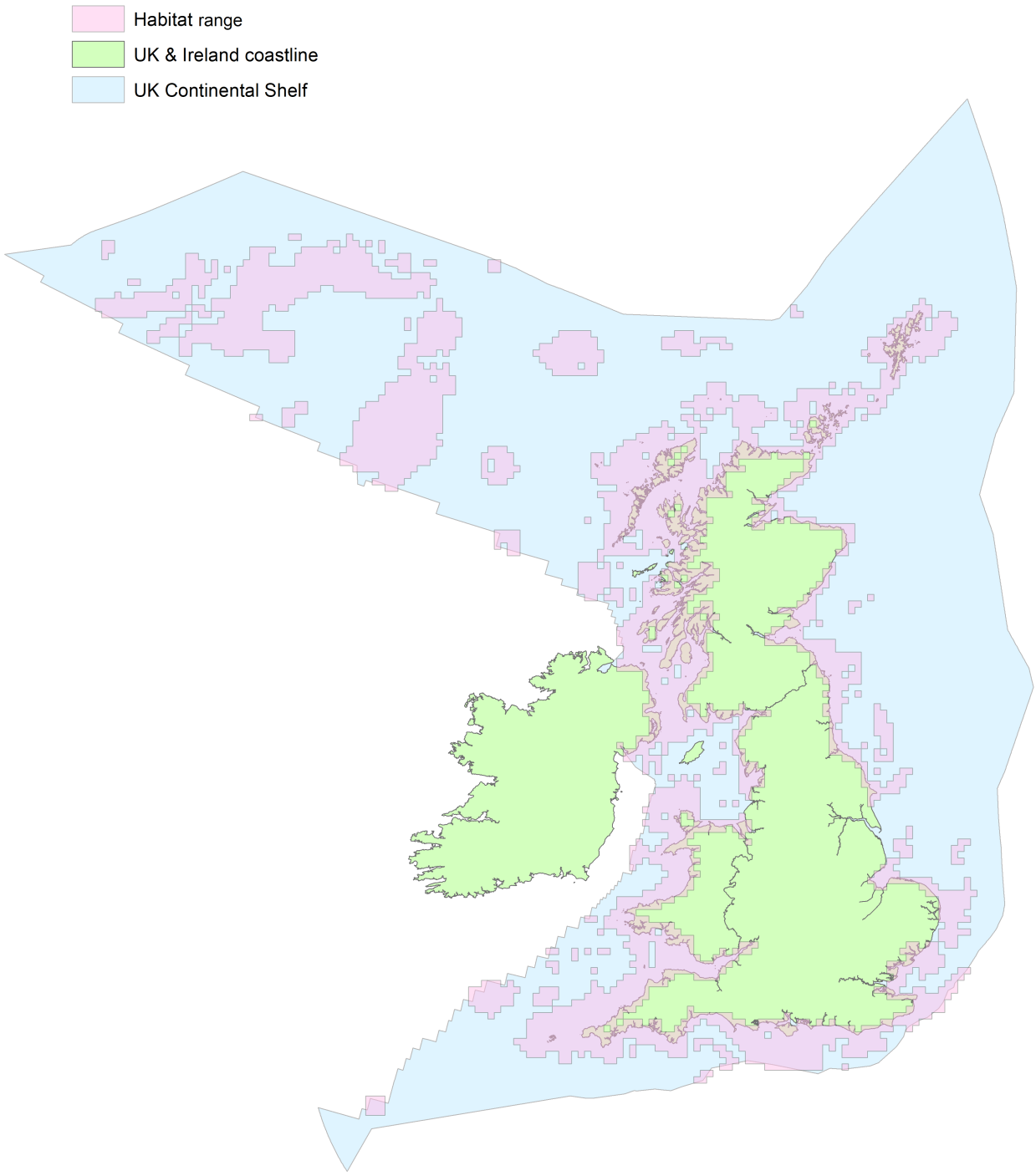

Figure 2: UK range map for H1170 - Reefs.

The UK range map was developed from the UK surface area map, but additionally included an area of iceberg ploughmarks off North-West Scotland in offshore waters, where cobble reefs had been recorded (JNCC, 2018a).

Explanatory Notes

Habitat code: 1170 Region code: MATL

Field label	Note
6.1 Condition of habitat	(a) Area in good condition -the Reef in the following SACs is either in favourable-maintained, favourable-recovered, favourable- unclassified (SACs were Dornoch Firth & Morrich More, Loch Creran, Firth of Lorn, Isle of May, Loch Laxford, Loch nam Madadh, Mousa, North Rona, Papa Stour, Sanday, Solway Firth). There are also areas of relevant Reef habitats in the NC MPAs (Fetlar to Haroldswick, Small Isles, Noss Head and Upper Loch Fyne and Loch Goil) which have a 'conserve' conservation objective and hence favourable condition and these were also included where the habitat polygons had been incorporated in to the JNCC habitat layer. Some sites have not been assessed through site condition monitoring (Sound of Barra SCI, East Mingulay SCI, Berwickshire and North Northumberland Coast SAC, Luce Bay and Sands SAC and Solway SAC). These and areas of reef outside of the SACs and NCMPAs are in the following marine regions, where in Scotland's Marine Atlas (Baxter et al. 2011) subtidal rock has been assessed as follows (note this habitat has been used as this is the predominant habitat for the purposes of this assessment, but it is acknowleged that intertidal rock is a component of the Reef feature too): East Scotland Coast, North Scotland Coast, East and West Shetland, Hebrides, Minches and Malin Sea, Solway and North Channel - all stable, few concerns. Therefore areas of reef outside of assessed protected areas in these regions are all considered to be in 'good' condition. Further details of the sites included are in SNH internal document A2683791). Therefore the area in good condition = total area of reef 12203.954 - area of reef in bad condition 206.750 (see below) = 11997.204km2 (b) Area in not-good condition - only one of the reef SACs that have been assessed through SCM is considered to be in not-good condition (Lochs Duich Long and Alsh SAC - unfavourable declining in relation to the horse mussel beds in the site). Areas of reef outside of the SACs and NCMPAs in the Clyde region were asssed by Baxter et al. (2011) as deteriorating, few concerns. Therefore the areas of reef in the Clyde Region would be considered to be in not-good condition (see SNH internal document A2631873). Therefore the total area in not good condition = Area of reef in Clyde region (206.589km2) + area of Modiolus in Lochs Duich Long and Alsh (0.160587km2) = 206.750 km2.
6.4 Short term trend of habitat area in good condition; Direction	Stable has been noted as the short term trend overall for Reefs. The areas of habitat in good condition were taken from MPAs. For the majority of these MPAs there is no indication that there has been any notable deterioration in the reef, or reef associated features within them over the period 2007-2018 but there has been limited repeat surveys in these sites so therefore this is based mainly on extrapolation from a limited amount of data However if this assessment were to be done for the subtypes of reef individually, we would conclude stable for rocky reefs but uncertain/decreasing for biogenic reefs because of localised declines of serpulid reefs in Loch Creran and Modilous beds in Lochs Duich Long and Alsh (see 6.5 below), declines in blue mussel beds, loss of a Modioulus bed on the Cromarty Firth and the loss of serpulid reef in Loch Teacius which is part of the Loch Sunart MPA.

6.5 Short term trend of habitat area in good condition; Method used	For the vast majority of the habitat which is rocky reefs, in SACs and NC MPAs which have been used to assess the habitat area in good condition, there is no indication that the habitat condition between 2007-2018 has been anything apart from stable.However, there has been a lack of repeated survey effort across these sites that would allow confirmation of this and so this assessment is based mainly on expert opinion with very limited data. However, there have been declines in biogenic reef (as oulined in 6.4) which only make up a small amount of the overall reef resource (hence why overall short term trend is still stable). There have been declines in both Loch Creran and Lochs Duich, Long and Alsh have had repeated surveys of their serpulid reefs and horse mussel beds repeatedly. Whilst the earlier data is before the trend period requested of 2007-2018 (therefore a longer period has been considered) the surveys in Loch Creran revealed a decline in the condition of the serpulid reefs due to storm damage, but it is believed that the reefs should recover (status is unfavorable recovering). The surveys in Lochs Duich Long and Alsh indicated that there may be a decline in the horse mussel beds but the reasons for this are unclear. In the other SAC and NCMPAs there is no indication of the reef features being anything except stable e.g. through casework surveys, surveys outside of specific site condition monitoring work. Outside of these protected sites, stable is the trend indicated by Baxter et al. (2011) for all but one Scottish Region where Reef occurs in territorial waters, but again this is for rocky reefs. For biogenic reefs there have been declines as outlined in 6.4 above.
7.1 Characterisation of pressures/ threats	Continued from above. E03 - Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) is still occurring on this habitat within Scottish waters. Therefore it has been included again in this reporting round as a pressure but it has not been included as a threat due to the limit of 10 being imposed, and it was considered that other threats should be included before this one as the scale of the impact spatially is relatively low in comparison to the potential extent of other pressures e.g. fishing, climate change. N01, N05 - Climate change pressures - several of the components of this habitat e.g. horse mussel beds, serpulid reefs, are assessed as having medium-high sensitivity to climate change pressures i.e. sea temperature rise, ocean acidification and increased freshwater runoff /increased sedimentation and increased storm/wave impact, based on literature and existing sensitivity assessments. They are likely to be exposed to these pressures in the future under projected scenarios and therefore have medium vulnerability to climate change pressures within MPAs. This is detailed in a report due to be published by SNH - Strong et al. (unpublished). Therefore it has been included as a future threat. I02: Other invasive alien species (other than species of Union concern) - there are records of non-native invasive species within protected sites e.g. D.vex in Loch Creran and throughout the wider seas in Scotland, as outlined in https://www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-and-seas/marine-non-native-species. These may not pose more than a low pressure at present but they could be viewed as a medium threat to reefs and their sub-types. D06: Transmission of electricity and communications (cables) - the laying on cables poses a current pressure and threat to particularly sensitive sub-types of reef, i.e. horse mussel beds and northern sea fan adn sponge communities. In the 2013 reporting round discharges associated with industry, agriculture and residential activities/discharge (F20, F21, A28) and military activities (H02) were all rated low in terms of pressures and threats. This status has not changed and therefore as low pressures and threats are not included for the 2019 reporting round, these activities have not been included. J02 - Marine water pollution has been included as a catch all pressure/threat to include other sources of marine pollution outside of aquaculture which currently affect reefs and could in the future.

7.1 Characterisation of pressures/ threats	G01 and G03 - Fishing - Reef in both protected sites and the wider marine environment is likely to have experienced this pressure during the reporting period. The Regulation 33 documents for the SACs (although these are due to be updated) and Management Options Papers produced for the NC MPAs also outline the sensitivity and potential vulnerability of the protected features to mobile fishing gear (see section 3.2). Whilst fisheries management has now been in place (as of 2016) or is planned (2018) for the protected sites (SACs and NC MPAs), Annex I Reef outside of protected sites or existing fisheries closures are not protected from this pressure (see Marine Scotland (2016, 2017a)). There is a review ongoing to look at the potential to manage fishing in relation to certain components of Reef outside of protected sites in Scotland. Therefore is has been assigned as a medium pressure and high threat. G16 - Fish and shellfish harvesting - Reef in both protected sites and the wider marine environment have experienced this pressure during the reporting period due to the presence of aquaculture developments within and outside sites, and will continue to do so in the future. The pressure on this habitat may increase in the future due to commitments from Scottish Government and the industry to increase sustainable aquaculture production (See Marine Scotland, 2017b). The Regulation 33 documents for the SACs (although these are due to be updated) and Management Options Papers produced for the NC MPAs also outline the sensitivity and potential vulnerability of the protected features to aquaculture (see section 3.2).However this industry is regulated by SEPA, Marine Scotland and local authorities and therefore the rank has been assessed as medium for both the pressure and the threat. F08: Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas - the equivalent to this was previously assessed in 2013 as being a medium pressure to this habitat. It continues to be a pressure this habitat experiences although managed within MPAs through the Habitats Regulations Appraisal process or the Section 83 assessment. However outside of sites with increasing populations and coastal development this is still a pressure and is likely to continue to be in the future.
8.5 List of main conservation measures	CG09 has been included in terms of addressing other issues arising from aquaculture e.g. use of wrasse for sea lice removal, urchins, invasive non-native species. CC06 (Reduce impact of serivce corridors and networks) has been included in terms management via licensing that covers reducing the impact of cabling routes.

9.1 Future prospects of parameters	Based on the fact that the majority of the Reef resource in Scottish territorial waters is composed of rocky reefs, we believe that the range and area of this habitat should remain stable in the future over the next 12 year period based on the monitoring data within sites and the conservation measures that are currently in place or planned, both within MPAs and outside of protected areas. We propose that there is the potential for a positive trend in structure and function of this habitat, albeit slight/moderate, based on the management measures now in place and those that are proposed both inside and outside protected areas. However, it should be recognised that there are uncertainties in the positive assessment because the new management measures are being targeted on the basis of the existing evidence-base only and it is unclear whether there may be future iterations needed similar to the current Priority Marine Feature (PMF) review process which looks to put fisheries management measures in place outside of MPAs. . It is also clear from recent work (e.g. in Loch Carron on flameshell beds) that human activities will continue to modify examples of our most sensitive PMFs in areas where no survey records currently exist. Therefore there maybe areas of Reef habitat that we are currently unaware of that are being impacted by human activities. However, as we are now taking very positive steps in relation to the most sensitive components of Reef in Scotland and the key pressures / threats, this has been recognised in the future prospect trends of stable area and positive structure and function. However,if we were to consider the biogenic reef separately, we believe that there is potential for the range and the area of the habitat to be negative because of the potential impacts of climate change impacting on these attributes and due to the declines we have seen in area for biogenic habitat already e.g. declines in blue mussel beds, and indications about loss of horse mussel beds from the north (Gormley et al. 2013). For structure and function the assessment for biogenic habitats would be uncertain because although there should be positive improvements in this with regard to the fisheries management being put in place inside MPAs and in the wider seas around Scotland, again there is uncertainty about how climate change pressures may affect features, e.g. storm impacts on serpulid reefs, and how this will interact with benefits from management measures.
11.5 Short term trend of habitat area in good condition within the network; Method used	For the vast majority of the habitat which is rocky reefs, in SACs that have been used to assess the habitat area in good condition, there is no indication that the habitat condition between 2007-2018 has been anything apart from stable.However, there has been a lack of repeated survey effort across these sites that would allow confirmation of this and so this assessment is based mainly on expert opinion with very limited data. There have been declines in Loch Creran which has had repeated surveys of its serpulid reefs. Whilst the earlier data is before the trend period requested of 2007-2018 (therefore a longer period has been considered) the surveys in Loch Creran revealed a decline in the condition of the serpulid reefs due to storm damage, but it is believed that the reefs could recover (status is unfavorable recovering). In the other SACs there is no indication of the reef features being anything except stable e.g. through casework surveys, surveys outside of specific site condition monitoring work.