

NPWS

**South-east Rockall Bank SAC
(site code: 003002)**

**Conservation objectives supporting document -
Marine Habitats**

Version 1

February 2022

Contents

Introduction	3
Section 1.....	5
Principal Benthic Communities	5
South-east Rockall Bank Reef Community complex	5
Section 2.....	9
Appropriate Assessment Notes.....	9
Annex I Habitats	9
Bibliography	13
Figure 1. Mapped Annex I Reef habitat in South-east Rockall Bank SAC	14
Figure 2. Mapped geological features which are used as indicators of the reef community complex in the South-east Rockall Bank SAC	15

Please note that this document should be read in conjunction with the following report: NPWS (2022) Conservation Objectives: South-east Rockall Bank SAC 003002. Version 1.0. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Introduction

The South-east Rockall Bank is a relatively shallow bank to the north-west of Ireland, separated from the Porcupine Shelf by deeper areas within the Rockall Trough; it is situated 335 km north-west of Co. Mayo. South-east Rockall Bank SAC is designated for the marine Annex I qualifying interest of Reefs (1170) (Figure 1).

The national seabed mapping programme INFOMAR (Dorschel *et al.*, 2010) and the Irish National Seabed Survey (GSI, 2002) provided the offshore bathymetry data to identify likely carbonate mounds and other geological features which have been used as indicators of reef habitat in this SAC (Figure 2). Specific surveys in South-east Rockall Bank SAC provide biological data on the geological formations within the site (Guinan & Leahy, 2010; La Bianca *et al.*, 2019). A synthesis report commissioned by NPWS in 2017 (Forde *et al.*, in prep.) outlines the ecological setting, distribution and structure of reef habitat and associated communities in Irish offshore waters.

In the Irish offshore environment (i.e. waters greater than 200m in depth), reef communities are associated with geological features such as sea mounds, canyons, escarpments, flat and sloping bedrock, and boulder, cobble and/or drop-stone pavements. Some of these features are the result of erosion or glacial depositional events. The reef communities can be broadly divided into geogenic and biogenic reef. Geogenic reef is defined as rock substrate on which marine species attach and grow; biogenic reef is defined as hard substrate formed by the growth of animals which can accumulate over successive generations.

Geogenic reef in deeper water tends to be found on the continental slope, particularly in submarine canyons and on the flanks of seamounts. The communities that occur here commonly form multispecies assemblages of octocorals and antipatharians (or coral gardens), which in turn create structural habitat for other fauna.

In Irish offshore waters, biogenic reef is largely the result of the scleractinian coral *Desmophyllum pertusum* (syn. *Lophelia pertusa*), which is common and widespread here (Forde *et al.*, in prep.). The secondary scleractinians reef-forming species *Madrepora oculata* and *Solenosmilia variabilis* also occur, the latter occurring at water depths greater than 1,000m. Coral carbonate mounds are distinct features that are formed over timescales of 1 to 2 million years by successive periods of growth, erosion and sedimentation of reef-forming corals. Morphological variation between mounds is attributed to the local environmental conditions under which the mounds are initiated and grow. These mounds can comprise a variety of habitat types including coral reef, coral rubble, stabilised and mobile sediments, and cobble grounds, each supporting distinct macrofaunal communities.

In the offshore environment where reef occurs, regardless of whether it is geogenic or biogenic, biodiversity is greatly increased and therefore these communities are considered to be keystone communities. Reefs can be considered an oasis of biodiversity above what is found in surrounding waters.

Aspects of the ecology of the Annex I Reefs habitat are provided in Section 1. The corresponding site-specific conservation objective will facilitate Ireland delivering on its surveillance and reporting obligations under the EU Habitats Directive (92/43/EC), and the preservation or restoration of the integrity of the Natura 2000 site.

Ireland also has an obligation to ensure that consent decisions concerning operations/activities planned for Natura 2000 sites (also known as European sites) are informed by an appropriate assessment of the likelihood that such operations or activities are having a significant effect on the site, or adversely affecting site integrity. Further ancillary information concerning the practical application of the site-specific conservation objective and its associated targets in the completion of such assessments is provided in Section 2.

Section 1

Principal Benthic Communities

Marine habitats are frequently composed of a number of different biological communities. The development of a community complex target arises when an area possesses similar abiotic features but records a number of biological communities that are not regarded as being sufficiently stable and/or distinct, temporally or spatially, to become the focus of conservation efforts. The biological communities recorded within South-east Rockall Bank SAC exhibit this pattern and have been grouped together into a suitable ecological unit (i.e. community complex) upon which to develop conservation targets. The components of this complex may have certain species in common, albeit with varying prevalence, as well as physical parameters that may or may not overlap; this is recognised by identifying the relevant Marine Habitat Classification of Britain and Ireland (MHCBI) communities (Parry *et al.*, 2015) that occur within this complex.

South-east Rockall Bank Reef Community Complex

A number of carbonate mounds are present in the south-west and in the centre of the SAC, with the most significant of these measuring 15km² at its base (Dorschel *et al.*, 2010) — see Figure 2. Escarpments are significant features of the South-east Rockall Bank SAC.

The fauna of the community complex is very diverse in places. Sponge aggregations, coral gardens and scleractinian reefs occur on various geological features within this SAC.

Mid bathyal communities at depths of approximately 650m and 1,000m are described for this SAC. On cobbles, boulders and on coral rubble formed by the scleractinian species *Desmophyllum pertusum* (syn. *Lophelia pertusa*) and *Madrepora oculata*, the Atlantic mid bathyal cold water coral reef (biogenic structure)¹ community occurs. Aggregations of the sponge of *Phakellia ventilabrum* also occur within this community, as well as black corals, including *Leiopathes* sp. and *Stichopathes* cf. *gravieri*, the gorgonian coral *Paramuricea* sp., the anemone *Actinaria* sp. and the echinoid *Cidaris cidaris*.

Dense areas of reef formed by *Desmophyllum pertusum* (syn. *Lophelia pertusa*) and *Madrepora oculata* occur on rock outcrops, vertical ledges and on boulders and pebble strewn substrate. This Mixed coral assemblage on Atlantic mid bathyal *Desmophyllum pertusum* (syn. *Lophelia pertusa*) reef framework (biogenic structure) community² is particularly dense on the summit of surveyed mounds.

¹ M.AtMB.Bi.CorRee

² M.AtMB.Bi.CorRee.LopFra

A variety of fish species are present here, including monkfish, blue-mouth rose fish, *Lepidion eques* and the rare elasmobranch *Oxynotus paradoxus*. Crab species observed include *Chaecon affinis* and a variety of spider crabs.

The Atlantic mid bathyal rock and other hard substrata community³ occurs on exposed bedrock and also on cobbles and boulders with sparse coral gravel/rubble. On the bedrock a variety of corals, including the black corals *Leiopathes* sp., and *Stichopathes* cf. *gravieri*, sponges, including the glass sponge *Euplectella aspergillum* and the demosponge *Phakellia ventilabrum*, and anemones occur. On cobbles and gravel, *S. cf. gravieri*, the anemone *Actinaria* sp., along with barnacles and the echinoid *Cidaris cidaris*, are present.

Where the Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata⁴ occurs, coral is often dense and forms coral gardens. Coral species present here include the black corals *Leiopathes* sp., *Phanopathes* sp., *Dendrobathypathes* sp. and *Stichopathes* sp. In places, the community hosts the octocorals *Paramuricea* sp. and *Callogorgia verticillata* and a variety of sponges including the demosponge *Phakellia ventilabrum*, which in places forms sponge aggregations. These aggregations sometimes co-dominate with *Desmophyllum pertusum* (syn. *Lophelia pertusa*) and *Madrepora oculata*.

The Solitary scleractinian field on Atlantic mid bathyal coarse sediment community⁵ is noted from inclined hard substrate with occasional rocks or coarse ground. Here the fauna is dominated by the solitary coral *Caryophyllia* sp. Sponges present here include the demosponge *Phakellia ventilabrum*.

In deeper water below 1,300m, lower bathyal communities are described. At these depths the scleractinian species *Desmophyllum pertusum* (syn. *Lophelia pertusa*) is supplanted by *Solenosmilia variabilis*.

On carbonate vertical wall and on steep bedrock with overhangings, the Discrete *Solenosmilia variabilis* colonies on Atlantic lower bathyal rock and other hard substrata⁶ community occurs. Brisingiids, a variety of sponges, including *Mycale lingua* (lamellate, yellow and blue encrusting forms), and corals, including the solitary coral *Caryophyllia* sp. and the bamboo coral *Eknomisis* sp., are present within this community. On occasion, the bamboo coral *Jasonisis* sp. dominates. Fish species noted here include the leafscale gulper shark *Centrophorus squamosus*.

³ M.AtMB.Ro

⁴ M.AtMB.Ro.MixCor

⁵ M.AtMB.Co.SolScl

⁶ M.AtLB.Ro.MixCor.DisSol

A Mixed coral assemblage on Atlantic lower bathyal *Solenosmilia* reef framework (biogenic structure) community⁷ occurs extensively within the SAC. It host sponges including *Mycale lingua*, *Phakellia ventilabrum* and also lamellate forms; corals present include zoanthids and the octocorals *Paragorgia* sp., *Eknomisis* sp., *Jasonisis* sp. and *Paragorgia* sp. Fish species noted here are orange roughy *Hoplostethus atlanticus* and the leafscale gulper shark *C. squamosus*.

Extensive reefs formed by *Solenosmilia variabilis* are associated with some of the mounds explored in this SAC. This Atlantic lower bathyal cold water coral reef (biogenic structure) community⁸ hosts a variety of sponge and coral gardens. Sponges observed here include *Mycale lingua* (yellow encrusting and lamellate lobose forms), as well as the glass sponge *Aphrocallistes* sp. The bivalve *Acesta excavata* along with the fish species, orange roughy *Hoplostethus atlanticus*, the false boarfish *Neocyttus helgae*, leafscale gulper shark *Centrophorus squamosus* and the common ling *Molva molva* are also noted here.

On a muddy substrate with coral gravel, cobbles and boulders, a Mixed cold water coral community on Atlantic lower bathyal coarse sediment⁹ occurs. Here, reef formed by the scleractinian species *Solenosmilia variabilis* is sparse, with large specimens of the black coral *Leiopathes* sp. also present.

A Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata¹⁰ occurs on boulders on muddy slopes with occasional clumps of the scleractinian coral *Solenosmilia variabilis*; a range of sponges including *Mycale lingua* and the black coral *Leiopathes* sp. are noted within this community. On vertical hard substrata, *S. variabilis* and the bivalve *Acesta excavata* occur together. The boar fish *Neocyttus helgae* is observed within this community.

The Atlantic lower bathyal rock and other hard substrata community¹¹ occurs on mud veneered bedrock, carbonate mounds and on cobbles and carbonate boulders. In general, the ophiuroid *Ophiomuseum lymani* dominates while the anemone *Actinaria* sp. along with the corals *Eknomisis* sp. and *Caryophyllia* sp. also occur.

On boulders in otherwise soft ground at approximately 1,350m, a variation of the Deep sponge aggregation on Atlantic lower bathyal rock and other hard substrata community¹² occurs. Here

⁷ M.AtLB.Bi.CorRee.SolFra

⁸ M.AtLB.Bi.CorRee

⁹ M.AtLB.Co.MixCor

¹⁰ M.AtLB.Ro.MixCor

¹¹ M.AtLB.Ro

¹² (var) M.AtLB.Ro.DeeSpo

lamellate sponges cf. *Phakellia ventilabrum* are abundant and occur along with white encrusting sponges and the black coral *Leiopathes* sp.

South-east Rockall Bank Reef Community Complex

<i>Solenosmilia variabilis</i>	<i>Desmophyllum pertusum</i> (syn. <i>Lophelia pertusa</i>)
<i>Madrepora oculata</i>	<i>Leiopathes</i> sp.*
<i>Mycale lingua*</i>	<i>Eknomisis</i> sp. *
<i>Porifera lamellate lobose*</i>	<i>Porifera lamellate</i> sp. (foliate) *
<i>Caryophyllia</i>	<i>Porifera lamellate</i> * (<i>hexactinosida</i>)
<i>Acesta excavata</i>	<i>Acesta excavata</i>
<i>Porifera encrusting</i> sp. yellow*	<i>Jasonisis</i> sp.*
<i>Phakellia ventilabrum*</i>	<i>Porifera vase</i> (cf. <i>Aphrocallistes</i>)
<i>Centrophorus squamosus</i>	<i>Hoplostethus atlanticus</i>

* As per Howell & Davies (2010)

Section 2

Appropriate Assessment Notes

Many plans and projects of a particular nature and/or size require the preparation of an environmental impact assessment of the likely effects of their planned development. While smaller operations/activities (i.e. sub-threshold developments) may not require the undertaking of such an assessment, an appropriate assessment and Natura Impact Statement is required of any project that may significantly affect the integrity of a Natura or European site. The assessment is to be used as part of the decision-making process, as to whether or not the project proceeds. The assessment should be recorded in a transparent manner, and should assess, in a reasoned manner, the likely effects on a Natura 2000 site of a proposed plan or project. General guidance on the completion of such assessments has been prepared and is available at www.npws.ie and at https://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm.

Annex I Habitats

It is worth considering at the outset that the extent and quality of all habitats varies considerably in space and time, and marine habitats are particularly prone to such variation. Habitats which are varying naturally, i.e. biotic and/or abiotic variables are changing within an envelope of natural variation, must be considered to have favourable conservation condition. Anthropogenic disturbance may be considered significant when it causes a change in biotic and/or abiotic variables in excess of what could reasonably be envisaged under natural processes. The capacity of the habitat to recover from this change is obviously an important consideration (i.e. habitat resilience) thereafter.

This Department has adopted a prioritized approach to conservation of structure and function in marine Annex I habitats.

1. Those communities that are key contributors to overall biodiversity at a site by virtue of their structure and/or function (keystone communities) and their low resilience should be afforded the highest degree of protection; any significant anthropogenic disturbance should be avoided.
2. In relation to the remaining constituent communities that are structurally important (e.g. broad sedimentary communities) within an Annex I marine habitat, the following must be considered:
 - 2.1. Significant anthropogenic disturbance may occur with such intensity and/or frequency as to effectively represent a continuous or ongoing source of disturbance over time and space (e.g. effluent discharge within a given area). Drawing from the principle outlined in the European Commission's Article 17 reporting framework that disturbance of greater than 25% of the

area of an Annex I habitat represents unfavourable conservation status, this Department takes the view that the cumulative area of continuous disturbance of each community type should not exceed an approximate area of 15%. Thereafter, an increasingly cautious approach is advocated. Prior to any consent being granted for any project or activities that would result in more than 15% of any Annexed marine habitat community type within a Natura site being disturbed on a cumulative basis, an inter-Departmental management review (considering *inter alia* robustness of available scientific knowledge, future site requirements, etc.) of the site is recommended.

2.2. Some activities may cause significant disturbance but may not necessarily represent a continuous or ongoing source of disturbance over time and space. This may arise for intermittent or episodic activities for which the receiving environment would have some resilience and may be expected to recover within a reasonable timeframe relative to the six-year reporting cycle (as required under Article 17 of the Directive). This Department is satisfied that such activities could be assessed in a context-specific manner giving due consideration to the proposed nature and scale of activities during the reporting cycle and the particular resilience of the receiving habitat in combination with other activities within the designated site.

The following technical clarification is provided in relation to specific conservation objectives and targets for Annex I habitat Reefs in order to facilitate the analysis required for the appropriate assessment process:

Objective To maintain the favourable conservation condition of reefs in South-east Rockall Bank SAC, which is defined by the following list of attributes and targets:

Target 1 The permanent habitat area is stable or increasing, subject to natural processes

- In the deep water environment reef habitat is associated with geological features such as canyons, sea mounds, terraces and escarpments. In South-east Rockall Bank SAC, sea mound and escarpment features have been used as indicators of the likely distribution of reef habitat in this SAC (Figure 2). However, it should be noted that the area and distribution of Reefs within this SAC is an approximation. The full extent of the aforementioned geological features and certain topographies, such as rock outcrops and cobble or boulder fields, may not have been mapped.

- Reefs may further encompass topographic features including vertical rock wall, ledges, overhangs, sloping or flat bedrock, and boulder and cobbles fields. A reference area for the habitat is therefore a gross underestimate of the actual area present due to the three-dimensional nature of this habitat.
- This target refers to the permanent amount of habitat area within the site. It needs to be considered particularly when assessing the effects of projects, plans, activities or operations that propose to permanently remove habitat from the site, thereby reducing the permanent amount of habitat area within it. It does not incorporate the consideration of long or short term disturbance of the biology of a site.
- Early consultation or scoping with the Department in advance of a formal application to a consenting authority is advisable for such proposals.

Target 2 The distribution of reefs is stable or increasing, subject to natural processes

- The mapping of the seafloor with sophisticated acoustic systems, followed by surveying of identified features with camera systems attached to Remotely Operated Vehicles (ROV), has allowed the distribution of certain geological features to be used as indicators of the likely distribution of reef habitat. In the case of the South-east Rockall Bank SAC, sea mounds are the indicators of reef in this SAC (Figure 2).
- Both biogenic and geogenic reef communities are considered to be keystone communities that are of considerable importance to the overall ecology and biodiversity of a habitat by virtue of their physical complexity; any significant anthropogenic disturbance to the distribution of these features within the SAC should be avoided.
- This target refers to activities or operations that propose to permanently remove reef habitat, thus reducing the range over which this habitat occurs within the site. Reef habitat refers to any hard substrate including coral rubble. It does not refer to long or short term disturbance of the biology of reef habitats.
- Early consultation or scoping with the Department in advance of a formal application is advisable for such proposals.

Target 3 Maintain the structural integrity of the South-east Rockall Bank reef community complex

- For biogenic reef, this means that the three-dimensional structure of the reef remains intact and the proportion of living to dead reef remains within the range expected through natural processes.
- For geogenic reef this requires the continuing occurrence of large erect epifaunal species.
- It also requires that no evidence of increased siltation over the reef feature is present.
- Any significant anthropogenic disturbance to the structural integrity of these features within the SAC should be avoided.

Target 4 Conserve the South-east Rockall Bank reef community complex in a natural condition

- Biodiversity on both biogenic and geogenic reefs is dependent on the presence of habitat-forming coral species. In the Irish waters, deep water biogenic reef is largely the result of the scleractinian coral *Desmophyllum pertusum* (syn. *Lophelia pertusa*). On geogenic reef, a number of Alcyonacean and Antipatharian species that are potentially habitat-forming are found in Irish waters.
- A semi-quantitative description of the South-east Rockall Bank reef community complex at this site has been provided in Section 1.
- An interpolation of their likely distribution is provided in Figure 2.
- Within the South-east Rockall Bank SAC, the estimated area of known and likely features are:

Sea mounds 4,052ha

- This target relates to the structure and function of the reef and therefore it is of relevance to those activities that may cause disturbance to the ecology of the habitat.
- Any significant anthropogenic disturbance to the faunal assemblages of reef habitat within the SAC should be avoided.

Bibliography

- Dorschel, B., Wheeler, A.J., Monteys, X. & Verbruggen, K. (2010). *Atlas of the deep-water seabed: Ireland*. Springer, Netherlands, 1–164.
- Forde, J., Allcock, L. & Grehan, A. (in prep.). *Reef Habitat in Irish Offshore Waters – A synthesis of current knowledge*. Irish Wildlife Manuals, No. XXX. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.
- Geological Survey of Ireland (GSI) (2002). *Report of the Survey in Zone 3 of the Irish National Seabed Survey, Volume 1: Describing the Results and the Methods Used*, GOTECH, Dublin.
- Guinan, J. & Leahy, Y. (2010). *Habitat Mapping of Geogenic Reef Offshore Ireland*. A report to National Parks and Wildlife Service.
- Howell, K.L. & Davies, J.S. (2010). Deep-sea species image catalogue. DeepSeaCRU, Marine Biology and Ecology Research Centre, University of Plymouth. On-line version 2, 2016.
- La Bianca, G., Ross, R. & Howell, K. (2019). SEAROVER 2018 Deep Water Reef Habitat & Species Video Analysis Full Report, Commissioned by Marine Institute, Rinville, Oranmore, Co. Galway.
- Parry, M.E.V., K.L. Howell, B.E. Narayanaswamy, B.J. Bett, D.O.B. Jones, D.J. Hughes, N. Piechaud, T.D. Nickell, H. Ellwood, N. Askew, C. Jenkins and E. Manca (2015). A Deep-sea Section for the Marine Habitat Classification of Britain and Ireland. JNCC report 530. ISSN 0963 8901 In: JNCC (2015). *The Marine Habitat Classification for Britain and Ireland Version 15.03*. Available from: <https://mhc.jncc.gov.uk/>

Figure 1. Mapped Annex I Reef habitat in South-east Rockall Bank SAC

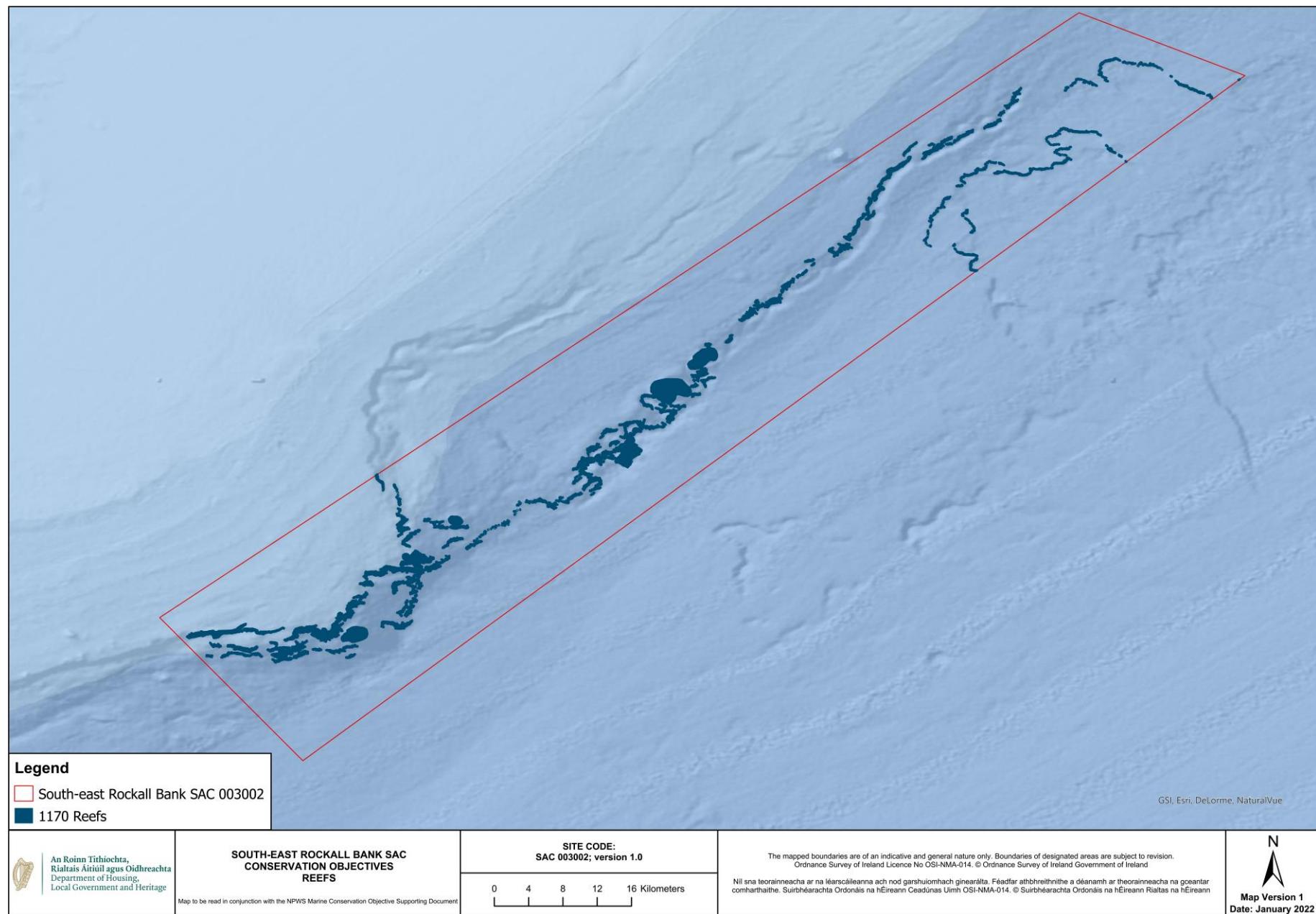


Figure 2. Mapped geological features which are used as indicators of the reef community complex in the South-east Rockall Bank SAC

