

NPWS

**Southern Canyons SAC
(site code: 002278)**

**Conservation objectives supporting document -
Marine Habitats**

Version 1

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Contents

Introduction	1
Section 1.....	3
Principal Benthic Communities.....	3
Southern Canyons Reef Community Complex.....	3
Section 2.....	6
Appropriate Assessment Notes	6
Annex I Habitats.....	6
Bibliography	10
Figure 1. Southern Canyons SAC Designation.....	11
Figure 2. Extent of Reefs in Southern Canyons SAC.....	12
Figure 3. Modelled Reef Community Complex in Southern Canyons SAC	13

Please note that this document should be read in conjunction with the following report: NPWS (2026) Conservation Objectives: Southern Canyons SAC 002278. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

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Introduction

The Southern Canyons SAC is located at the southern extreme of the Celtic Shelf where it slopes down to the Biscay Abyssal Plain (**Figure 1**). Its western boundary is located approximately 446km south-west of Mizen Head, Co. Cork and its eastern boundary is 476km south of Cape Clear, Co. Cork. It incorporates the area where the Goban Spur and Celtic Sea Continental Margin incises the shelf margin in a series of deep canyons. It includes canyons of the Whittard Canyon system. This site is designated for the marine Annex I habitat Reefs (EU habitat code 1170) (**Figure 2**).

In 2007, a canyon at the eastern boundary of Whittard Canyon system was surveyed as part of the MESH Deepwater Survey (Davies *et al.*, 2008). The national Irish National Seabed Survey (Geological Survey of Ireland, 2002) provided the offshore bathymetry data that allowed the identification of the canyons systems. Biological data was derived from a number of surveys undertaken by University of Galway (Allcock, 2018), and in particular the 2016 Biodiversity project funded by the Marine Institute and Science Foundation, Ireland. It was also informed by the 2019 Sea Rover survey (La Bianca *et al.*, 2020, Picton *et al.*, 2021). A synthesis report commissioned by NPWS in 2017 (Forde *et al.*, 2024) 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. The occurrence of these features are used as proxies for reef communities. The reef communities can be broadly divided into geogenic and biogenic reef. Geogenic reef is defined as rock substrate on which epifaunal species occur; biogenic reef is defined as hard substrate formed by animals.

Geogenic reef tends to be found on the continental slope, particularly in submarine canyons and on the flanks of seamounts. The communities commonly form multispecies assemblages of octocorals and antipatharians known as 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*) (Forde *et al.*, 2024). The secondary scleractinians, reef-forming species *Madrepora oculata* and *Solenosmilia variabilis*, also occur. Coral carbonate mounds are distinct features that are formed over timescales of one to two 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.

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 restoration of the integrity of the Natura 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 may have 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

Natural features are frequently composed of a number of different biological communities. The reasons for the occurrence of communities on a feature can sometimes vary over small spatial scales. Accurate representation of such communities when using spatial targets for conservation objectives can be difficult. By acknowledging this natural complexity as an amalgam of mosaicked communities (*i.e.* a complex), meaningful conservation objectives based on spatial targets for such a complex can be established. However, that the components of this complex may have certain species in common, albeit it at varying prevalence, and have physical parameters may or may not overlap is recognised by identifying the MHCBI communities (JNCC, 2015) which occur within this complex.

The biological communities found within Southern Canyons SAC exhibit this pattern and have been grouped together into a suitable ecological unit on which to develop conservation targets.

Southern Canyons Reef Community Complex

The Whittard Canyon occurs as four large deep canyons toward the eastern boundary of the site. Along the western boundary the Goban Spur is incised by less well defined canyons (**Figure 3**). The Whittard Canyons are in water depths of approximately 400m where they incise the continental shelf edge to over 3500m where they emerge in the abyssal plain. Those from the Goban Spur commence at 800m water depth and reach the abyssal plain at approximately 3500m.

Within the canyons systems there are bedrock cliffs and boulders, carbonate cliffs, boulders and small mounds. In the upper reaches of a canyon on the western end of the Whittard Canyon system, in water depths of between 500m and 600m, areas of high biodiversity occur on dense *Desmophyllum pertusum* (syn. *Lophelia pertusa*) reef. Within this Atlantic upper bathyal live *Lophelia pertusa* reef (biogenic structure) community another stone coral *Madrepora oculata* also occurs on bedrock cliffs. A variety of sponges, including encrusting and vase like forms occur among the hydrocorals. Primnoidae corals including large specimens of *Primnoa* sp. are also evident. Along the sheer carbonate cliffs, very dense stands of *D. pertusa* reef, soft corals, bamboo, black and large gorgonians corals are visible.

In the central area of the site *Desmophyllum pertusum* (syn. *Lophelia pertusa*) reef also occurs in deeper water, at depths of 1100m to 1200m. This Mixed coral assemblage on Atlantic mid bathyal *Lophelia pertusa* reef framework (biogenic structure) consists of both *D. pertusum* and *M. oculata* but also a

variety of corals including *Chrysogoria* sp., *Stichopathes* sp., *Acanella* sp. and gorgonian species. On sheer carbonate walls *D. pertusum* occurs as discrete clumps along with the bivalve *Acesta* and chrysogorgiid corals. Within this is a very diverse community described as Discrete *Lophelia pertusa* colonies on Atlantic mid bathyal rock and other hard substrata which includes solitary stone corals, soft corals (zoanthids), starfish (brisingids), bamboo corals (including *Keratoisis* sp.) and sponges. In other areas, this community contains dense areas on cup corals on carbonate cliff walls with the bivalve *Acesta* sp. and a variety of gorgonian corals. The anemone *Actinernus* sp. and glass sponges are also recorded here. Cliff faces in other areas exhibit a Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata. This fauna consists of corals such as *Calvularia* sp. *Primnoa* sp. and *Acanella* sp. and the hexactinellid sponge *Aphrocallistes beatrix*. Towards the east of the site coral rubble forms the basis for an Atlantic mid bathyal cold water coral reef (biogenic structure) community at the upper reaches of a small canyon. Here the scleractinian coral is largely in the form of broken rubble with some live clumps. The fauna consists of the black corals (*Stichopathes* sp. and *Leiopathes* sp.) with mobile crinoids occurring among the rubble. At the very eastern boundary of the site, in a side channel to the main canyon, an area of carbonate pavement occurs. A variety of black (including *Parantipathes* sp. and cf. *Trissopathes* sp.), bamboo and hydroid corals (e.g. *Stylaster* sp.) are found within the pavement area. In this area a Discrete *Lophelia pertusa* colonies on Atlantic mid bathyal rock and other hard substrata community occurs on narrow overhangs.

The scleractinian coral *Solenosmilia variabilis* occurs in a number of areas throughout the site. In the most western canyon of the Whittard system an Atlantic lower bathyal live *Solenosmilia variabilis* reef (biogenic structure) community occurs on vertical cliff walls with emergent cup corals and hydroids. A variety of corals including large specimens of *Primnoa* sp. and chrysogorgiids were also noted. The spectacular ophiuroid *Gorgocephalus* sp. is present on some of the corals. In the most western canyon of the Whittard system the *S. variabilis* is present as living reef structure and as a Mixed coral assemblage on Atlantic lower bathyal *Solenosmilia* reef framework (biogenic structure) community. Spectacular reef formed by *S. variabilis* occurs on sheer carbonate wall in some areas. Here large gorgonians, including *Acanthogorgia* sp. and the soft coral *Anthomastus* sp. are present as well as a variety of other corals interspersed with sponges, bivalves, small hydroid tubes and soft white corals. A Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata community is present on some overhangs. Here the fauna includes the coral *S. variabilis*, the bivalve *Acesta* sp., and the corals *Primnoa* sp., *Anthothela* sp., *Paramuricea* sp. and *Chrysogorgia* sp. This community is also found on a canyon wall in an area of strong currents where corals such as *Primnoa* sp., *Paramuricea* sp. were observed along with *S. variabilis*. In another area this community was observed on a vertical

canyon wall were it was dominated by large bamboo corals. In deeper waters, a sheer wall occurs from approximately 1500m to over 2800m. Here a Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata continues down to the upper abyssal zone (>3500m). Black corals including *Stauropathes* sp., the soft coral *Anthomastus* along with a variety of bamboo corals occur here. This highly diverse area includes crinoids, ascidians, brisingids, and glass sponges including *Aphrocallistes* sp. An extensive coral garden are recorded on the side of a canyon at a water depth of approximately 1600m. This Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata hosts large erect corals, which are extensive and dense in places. Scattered clumps of living and dead scleractinian coral *Solenosmilia variabilis* are present. This rich coral garden includes a variety of bamboo corals including *Keratoisis* sp., *Acanella* sp. and large specimens of *Lepidisis* sp., white and orange large erect planar corals, *Paragorgia* sp., *Paramuricea* sp., the black corals *Bathypathes* sp. A variety of glass and lamellar sponges and brisingid echinoderms occur here. In one area of the lower bathyal, at the divergence of a deep canyon the only record in Irish waters of the stalked crinoid *Endoxocrinus* sp. occurs. On a steep slope this rare erect and multi-armed species occurs within *S. variabilis* communities and also on rock. A variety of bamboo and black corals including *Parantipathes* sp. also occur within these communities.

On a sheer cliff wall with some small ledges an Atlantic upper abyssal rock and other hard substrata community was observed. Stalked red crinoids, *cf Porphyrocrinus thalassae* and the occasional yellow crinoids *Anachalypsicrinus nefertiti* were observed here. At the eastern reaches of the Goban Spur toward the abyssal plain, at depths of proximately 1300m an Atlantic mid bathyal rock and other hard substrate community occurs. This community is found on carbonate substrate were the fauna consists of lamellate and encrusting sponges. Boulders host colonies of *Desmophyllum pertusum* (syn. *Lophelia pertusa*) and various anemones.

Table 1 Species associated with the Southern Canyons Reef Community Complex

Southern Canyons Reef Community Complex	
<i>Desmophyllum pertusum</i>)	<i>Stichopathes</i> sp.
<i>Solenosmilia variabilis</i>	<i>Acesta</i> sp.
<i>Madrepora oculata</i>	<i>Keratoisis</i> sp.
<i>Primnoa</i> sp.	<i>Anthomastus</i> sp.
<i>Acanella</i> sp.	<i>Paramuricea</i> sp.
<i>Chrysogorgia</i> sp.	<i>Exdoxocrinus</i>

Section 2

Appropriate Assessment Notes

Many operations/activities of a particular nature and/or size require the preparation of an environmental impact statement (EIA) of the likely effects of their planned development. While smaller operations/activities (*i.e.* sub-EIA-threshold developments) may not require an EIA, an appropriate assessment is required of any project that may significantly affect the integrity of a Natura 2000 site. The appropriate assessment is to be used as part of the decision-making process, as to whether the project proceeds or not. 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 in relation to Annex I habitat Structure and Function, 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 prioritised 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 2000 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 the Annex I habitat Reefs to facilitate the appropriate assessment process:

Objective To restore the Favourable conservation condition of Reefs (EU habitat code 1170) in Southern Canyons SAC, which is defined by the following list of attributes and targets

Target 1	The permanent area is stable or increasing, subject to natural processes.
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- In the deep water environment, reef habitat is associated with geological features such as canyons, sea mounds, terraces and escarpments. In Southern Canyons SAC, sea mounds and canyons features have been used as indicators of the likely distribution of reef habitat in this SAC (**Figure 3**). However, it should be noted that the area and distribution of Reefs within this site 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 other 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 likely to be 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 this 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.
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- 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 Southern Canyons SAC, modelled reef and canyons features are the indicators of reef in this SAC (**Figure 3**).
- 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 site should be avoided.
- This target is relevant to activities or operations that propose to permanently remove reef habitat, thus reducing the range over which this habitat occurs within the SAC. Reefs habitat includes any hard substrate, including coral rubble. This target does not consider the long or short term disturbance of the biology of reef habitats.
- Early consultation or scoping with the Department in advance of formal application is advisable for such proposals.

Target 3	Maintain the structural integrity of the Southern Canyons Reef Community Complex, subject to natural processes.
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- For biogenic reef, this target requires that the three-dimensional structure of the reef remains intact and that 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 Southern Canyons Reef Community Complex in a natural condition, subject to natural processes.

- 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 species of *Alcyonacean* and *Antipatharian* corals, as well as large sponge species that have the potential to be habitat-forming, are found in Irish waters.
- A semi-quantitative description of the Southern Canyons Reef Community Complex at this SAC has been provided in **Section 1**.
- An interpolation of their likely distribution is provided in **Figure 3**.
- Within the Southern Canyons SAC, the estimated area of known and likely features are:
 - Sea mounds 134ha
 - Modelled Reef 33,649ha
- 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.

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Figure 1. Southern Canyons SAC Designation

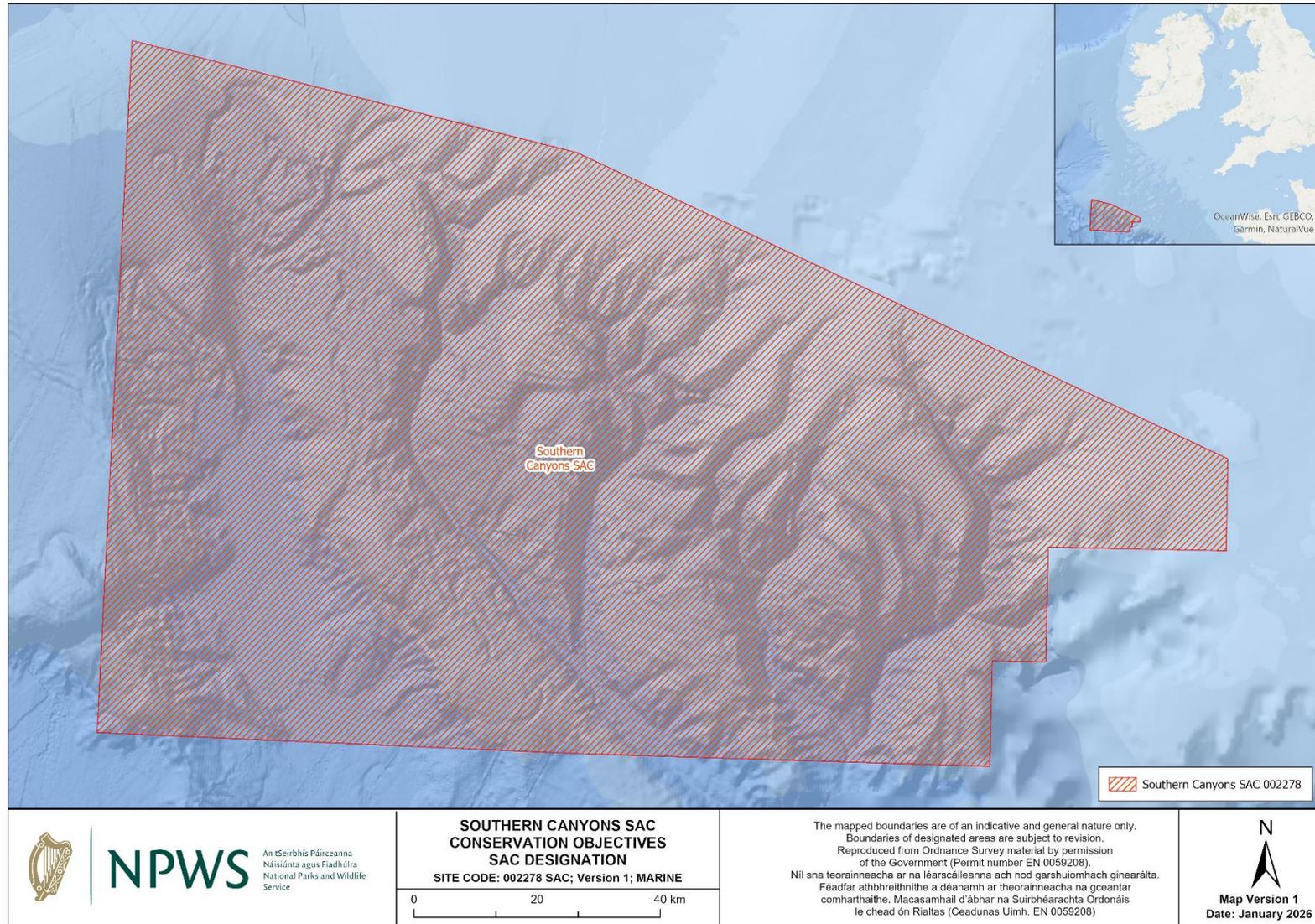
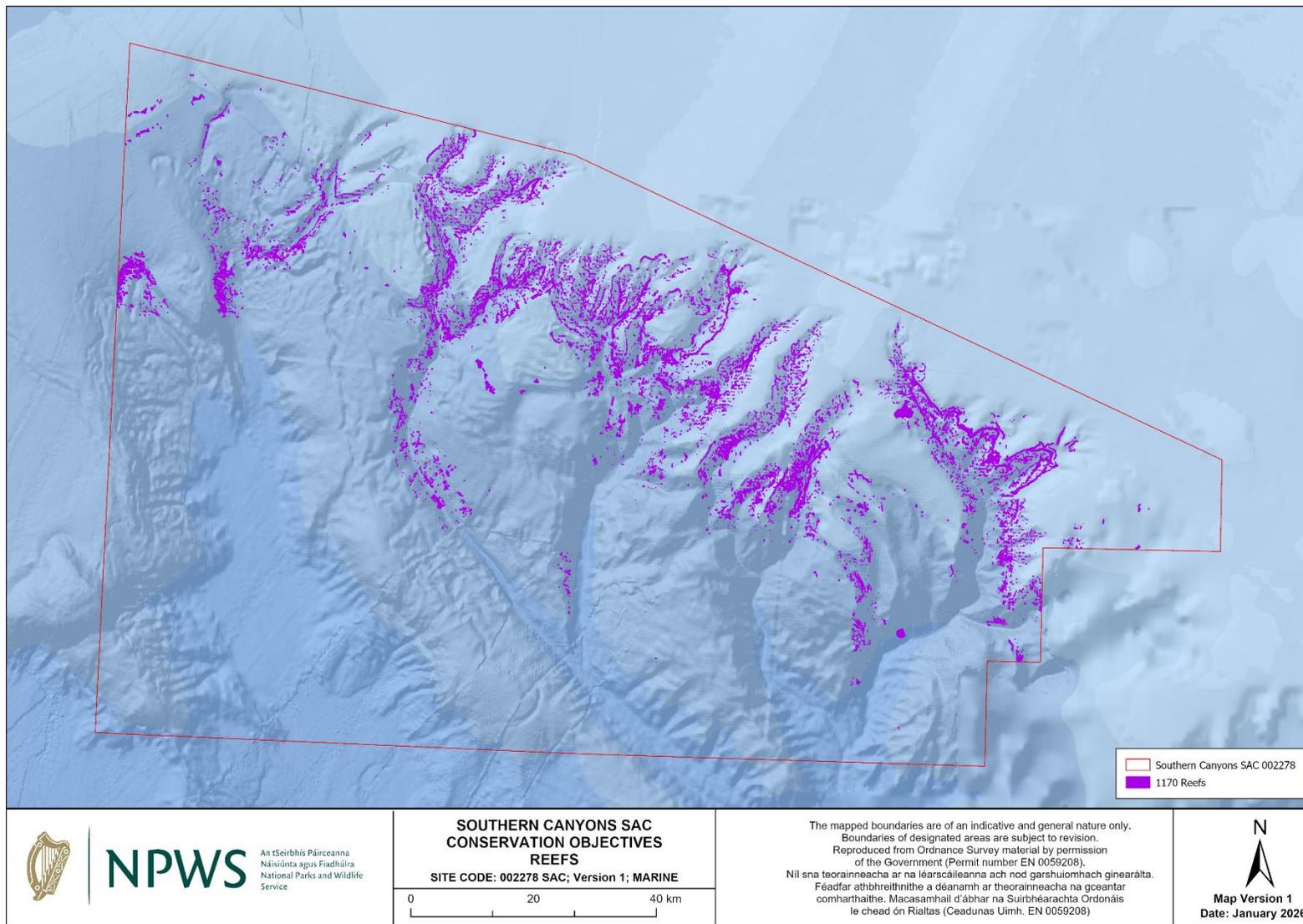
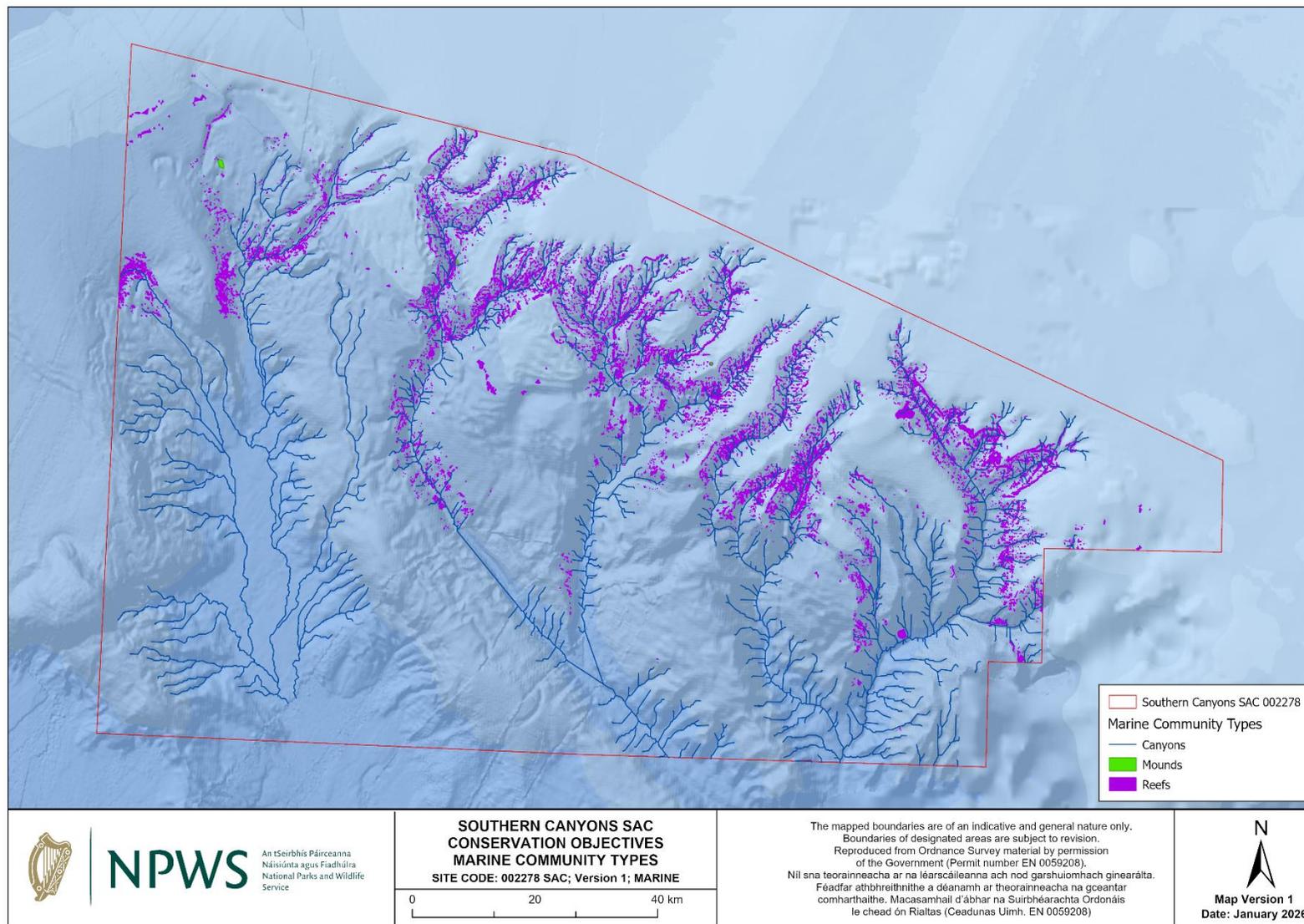


Figure 2. Extent of Reefs in Southern Canyons SAC



Map to be read in conjunction with the NPWS Conservation Objectives Document.

Figure 3. Modelled Reef Community Complex in Southern Canyons SAC



Map to be read in conjunction with the NPWS Conservation Objectives Document.