

NPWS

**Tory Island Coast SAC
(site code: 002259)**

**Conservation objectives supporting document -
Marine Habitats**

Version 2

IMPORTANT: This 'Version 2' document includes 1 additional QI (EU habitat code 8330). The text relating to the other pre-existing QIs has generally not been updated.

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Contents

Introduction	1
Section 1.....	2
Principal Benthic Communities	2
Intertidal reef community complex	2
Laminaria-dominated community complex	4
Subtidal reef with echinoderms and faunal turf community complex	5
Sea cave community complex	6
Section 2.....	8
Appropriate Assessment Notes	8
Annex I Habitats	8
Bibliography	13
Figure 1. Extent of Reefs in Tory Island Coast SAC	14
Figure 2. The potential distribution of Submerged or partially submerged sea caves in Tory Island Coast SAC.....	15
Figure 3. Distribution of marine community types in Tory Island Coast SAC	16

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Introduction

Tory Island Coast SAC (site code 002259) is designated for the marine Annex I qualifying interests of Reefs (EU habitat code 1170) and Submerged or partially submerged sea caves (EU habitat code 8330) (**Figures 1 and 2**).

A BioMar survey of this site was carried out in 1995 (Picton and Costello, 1997) and intertidal and subtidal reef surveys were undertaken in 2012 (MERC, 2012); these data were used to determine the physical and biological nature of this SAC.

The distribution and ecology of intertidal or subtidal sea caves has not previously been the subject of scientific investigation in Ireland and the extents of very few individual caves have been mapped in detail. Whilst surveys undertaken in the UK indicate the structure and functions of sea caves are largely influenced by hydrodynamic forces and water quality, no such information is yet available for Ireland.

Aspects of the biology and ecology of the Annex I habitats are provided in **Section 1**. The corresponding site-specific conservation objectives will facilitate Ireland delivering on its surveillance and reporting obligations under the EU Habitats Directive (92/43/EC).

Ireland also has an obligation to ensure that consent decisions concerning operations/activities planned for Natura 2000 sites are informed by an appropriate assessment where the likelihood of such operations or activities having a significant effect on the SAC cannot be excluded. Further ancillary information concerning the practical application of the site-specific objectives and targets in the completion of such assessments is provided in **Section 2**.

Section 1

Principal Benthic Communities

Within Tory Island Coast SAC, four community types were recorded in the Reefs and Submerged or partially submerged sea caves habitats. The Annex I habitats in which they are recorded is presented in **Table 1** and a description of each community type is given below.

Table 1 The community types recorded in Tory Island Coast SAC and their occurrence in the Annex I habitats for which the site is designated.

	SAC Annex I Habitats	
	Reefs (1170)	Submerged or partially submerged sea caves (8330)
Intertidal reef community complex	✓	
<i>Laminaria</i> -dominated community complex	✓	
Subtidal reef with echinoderms and faunal turf community complex	✓	
Sea cave community complex		✓

Estimated areas of each community type within the Annex I habitat, based on interpolation, are given in the objective targets in **Section 2**.

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. In this case, examination of the available data from Tory Island Coast identified a number of biological communities whose species composition overlapped significantly. Such biological communities are grouped together into what experts consider are sufficiently stable units (*i.e.* a complex) for conservation targets.

Intertidal reef community complex

This community complex is extensively distributed throughout the intertidal zone surrounding Tory Island (**Figure 3**). The substrate is flat or sloping bedrock shores, with occasional rock pools and shingle and boulder beaches. The southern and western shores are longer and more gently sloping. Sea cliffs occur to the northwest of the island at Toradavdun and Ardlarheen, to the east of Torbane, and to the northeast of East Town. The exposure regime is that of very exposed to exposed reef.

The species associated with this community complex include the gastropods *Patella vulgata*, the barnacle *Semibalanus balanoides* and the lichen *Verrucaria maura*. On the very exposed coasts and on the vertical cliff faces, these species co-occur with the bivalve *Mytilus edulis*. The red algae *Porphyra umbilicalis* and the brown alga *Himanthalia elongata* were also recorded here. On less exposed shores, species diversity is higher. In these conditions, the brown algae *Himanthalia elongata*, *Fucus serratus* and *Fucus vesiculosus*, the barnacle *Semibalanus balanoides* and the gastropods *Patella vulgata*, *Littorina littorea* and *Nucella lapillus* dominate. These species occur in association with carpets of the red alga *Osmundea pinnatifida*, which may be locally extensive. In both moderately and fully exposed areas, the top of the shore is dominated by the lichens *Verrucaria maura*, *Ramalina siliquosa* and *Xanthoria parietina* and the flowering plant *Armeria maritima*. Mats of *Ulva intestinalis* may occur here in association with freshwater runoff from the land. Where rock pools occur on the shore, the anthozoan *Actinia equina*, and the red algae *Corallina officinalis*, *Lithothamnion corallioides* and *Gelidium pulchellum* occur.

Table 2 Species associated with the Intertidal reef community complex.

Species associated with the Intertidal reef community complex	
<i>Patella vulgata</i>	<i>Lithothamnion corallioides</i>
<i>Littorina littorea</i>	<i>Corallina officinalis</i>
<i>Nucella lapillus</i>	<i>Lithothamnion corallioides</i>
<i>Mytilus edulis</i>	<i>Porphyra umbilicalis</i>
<i>Semibalanus balanoides</i>	<i>Gelidium pulchellum</i>
<i>Actinia equina</i>	<i>Ulva intestinalis</i>
<i>Fucus serratus</i>	<i>Verrucaria maura</i>
<i>Fucus vesiculosus</i>	<i>Ramalina siliquosa</i>
<i>Himanthalia elongata</i>	<i>Xanthoria parietina</i>
<i>Osmundea pinnatifida</i>	<i>Armeria maritima</i>

Laminaria-dominated community complex

This community complex occurs extensively throughout the site in depths of between 0m to 30m, in conditions ranging from very exposed to exposed (**Figure 3**).

The substrate is a mosaic of bedrock and boulders with pockets of sediments and cobble. The subtidal area adjacent to Tory Island is predominantly flat or sloping bedrock, while the area extending from approximately 400m south of Tory Island to the southern extent of this complex is predominantly cobbles and boulders on bedrock. Ledges and crevices occur commonly in the bedrock.

The biota of this complex is dominated by the brown alga *Laminaria hyperborea*. The density of *L. hyperborea* decreases below 25m. The associated flora includes the brown algae *Dictyota dichotoma*, the coralline red algae *Corallinaceae* spp., and the foliose red algae species *Plocamium cartilagineum*, *Cryptopleura ramosa*, *Acrosorium ciliolatum*, *Callophyllis laciniata*, *Delessaria sanguinea* and *Hypoglossum hypoglossoides*. Fauna associated with the kelp understory include the anthozoans *Caryophyllia* (*Caryophyllia*) *smithii* and *Corynactis viridis*, the echinoderms *Henricia oculata*, *Marthasterias glacialis*, *Luidia ciliaris*, *Antedon bifida*, *Echinus esculentus*, *Holothuria* (*Panningothuria*) *forskali* and *Asterias rubens*, the gastropod *Calliostoma zizyphinum* and the sponge *Pachymatisma johnstonia* (**Table 3**).

This community complex has unusually high species diversity. The rare brown alga *Carpomitra costata* occurs within this community complex on both bedrock and boulder substrates. This species is near the northern limit of its distribution at this site.

Table 3 Species associated with the *Laminaria*-dominated community complex.

Species associated with the <i>Laminaria</i> -dominated community complex	
<i>Laminaria hyperborea</i>	<i>Corynactis viridis</i>
<i>Dictyota dichotoma</i>	<i>Henricia oculata</i>
<i>Carpomitra costata</i>	<i>Marthasterias glacialis</i>
<i>Corallinaceae spp.</i>	<i>Luidia ciliaris</i>
<i>Plocamium cartilagineum</i>	<i>Antedon bifida</i>
<i>Cryptopleura ramosa</i>	<i>Echinus esculentus</i>
<i>Acrosorium ciliolatum</i>	<i>Holothuria (Panningothuria) forskali</i>
<i>Callophyllis laciniata</i>	<i>Calliostoma zizyphinum</i>
<i>Delessaria sanguinea</i>	<i>Pachymatisma johnstonia</i>
<i>Hypoglossum hypoglossoides</i>	<i>Echinocardium flavescens</i>
<i>Caryophyllia (Caryophyllia) smithii</i>	<i>Echinocardium cordatum</i>

Where pockets of sediment accumulate between reef outcrops, the sediment type is medium sand and the community is dominated by the echinoderms *Echinocardium flavescens* and *Echinocardium cordatum*.

Subtidal reef with echinoderms and faunal turf community complex

This community complex occurs extensively throughout the site in water depths from 30m to 55m in exposed conditions (**Figure 3**). The substrate is a mosaic of bedrock and boulders. To the north of Tory Island, the substrate is predominantly flat or sloping bedrock, while to the west, southwest and southeast of the island, the substrate is predominantly boulders and cobbles on bedrock. Ledges and crevices occur commonly in the bedrock.

Species associated with this community complex include the echinoderms *Holothuria (Panningothuria) forskali*, *Antedon bifida*, *Henricia oculata*, *Marthasterias glacialis*, *Luidia ciliaris* and *Echinus esculentus*, the anthozoans *Caryophyllia (Caryophyllia) smithii*, *Alcyonium digitatum* and *Corynactis viridis*, the sponges *Cliona celata*, *Polymastia boletiformis*, *Haliclona (Rhizoniera) viscosa*, *Pachymatisma johnstonia*, *Dysidea fragilis* and *Stelligera rigida*, the bryozoans *Parasmittina trispinosa* and *Pentapora foliacea*, the ascidian *Aplidium pallidum*, the gastropod *Calliostoma zizyphinum* and coralline red algae of the family *Corallinaceae* (**Table 4**).

Table 4 Species associated with the Subtidal reef with echinoderms and faunal turf community complex.

Species associated with the Subtidal reef with echinoderms and faunal turf community complex	
<i>Laminaria hyperborea</i>	<i>Leucosolenia botryoides</i>
<i>Delesseria sanguinea</i>	<i>Calliostoma zizyphinum</i>
<i>Bonnemaisonia asparagoides</i>	<i>Sertularella gayi</i>
<i>Kallymenia reniformis</i>	<i>Nemertesia ramosa</i>
<i>Nitophyllum punctatum</i>	<i>Schizotricha frutescens</i>
<i>Rhodymenia pseudopalmata</i>	<i>Parasmittina trispinosa</i>
<i>Dictyota dichotoma</i>	<i>Alcyonidium diaphanum</i>
<i>Dictyopteris polypodioides</i>	<i>Porella compressa</i>
<i>Cliona celata</i>	<i>Caryophyllia (Caryophyllia) smithii</i>

This complex is an important geographical variant of subtidal reef communities because of the combination of high species diversity and the very gradual zonation of this complex into the adjacent (and unusually deeply distributed) *Laminaria*-dominated community complex.

Sea cave community complex

Sea caves along the cliffs of Tory Island occur in hard metamorphic bedrock and are known to include partially submerged examples. Subtidal caves may also be present but have yet to be identified. Although the caves have not been formally surveyed it is likely that they are typical of sites that are wave-exposed, with strong tidal surge and excellent water quality. These types of caves support a distinctive sequence of communities from the illuminated entrances to the dimly lit inner walls.

In the entrance zone the likely species would include dense brown algal canopies (*Fucus serratus*, *Himanthalia elongata*) and kelp (*Laminaria hyperborea*, *Saccharina latissima*). In the understory, it is likely that *Corallina officinalis* and *Palmaria palmata* would be present. Fauna would be dominated by barnacles (*Semibalanus balanoides*) and limpets (*Patella vulgata*) on rock surfaces and ledges. Encrusting coralline algae thrive in shaded areas.

In the twilight zone, algal cover is sparse and suspension-feeding invertebrates prevail. Encrusting and branching sponges (*Halichondria panicea*, *Hymeniacidon perlevis*, *Lithophyllum*

incrustans), colonial ascidians (*Botryllus schlosseri*), hydroids, tube worms, barnacles and sea anemones (*Actinia equina*, *Sagartia elegans*) are common. Sea caves can provide shelter for juvenile fish and crustaceans and support rich filter-feeding assemblages important to coastal nutrient cycling. The relative inaccessibility of these habitats helps maintain them in good ecological condition. The species associated with this complex are given in **Table 5**.

Table 5 Species associated with the Sea cave community complex.

Species associated with the Sea cave community complex	
<i>Corallina officinalis</i>	<i>Lithophyllum incrustans</i>
<i>Palmaria palmata</i>	<i>Halichondria panicea</i>
<i>Fucus serratus</i>	<i>Hymeniacidon perlevis</i>
<i>Himanthalia elongata</i>	<i>Actinia equina</i>
<i>Semibalanus balanoides</i>	<i>Sagartia elegans</i>
<i>Patella vulgata</i>	<i>Botryllus schlosseri</i>
<i>Littorina littorea</i>	<i>Membranipora membranacea</i>
<i>Melarhaphe neritoides</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 and 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, there are two considerations.
 - 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 licensing of activities likely to cause continuous disturbance of each community type should not exceed an approximate area of 15%. Thereafter, an increasingly cautious approach is advocated. Prior to any further licensing of this category of activities, an interdepartmental 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 habitats to facilitate the appropriate assessment process:

Objective To maintain the Favourable conservation condition of Reefs (EU habitat code 1170) in Tory Island Coast 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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- The area of this habitat represents the minimum estimated area of reef at this site and underestimates the actual area due to the many areas of sheer and steeply sloping rock within the reef habitat.
- This target refers to activities or operations that propose to permanently remove habitat from the site, thereby reducing the permanent amount of habitat area. It does not refer to long or short term disturbance of the biology of a site.
- Early consultation or scoping with the Department in advance of formal application is advisable for such proposals.

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

- The likely distribution of Reef habitat in this SAC is indicated in **Figure 1**.
- 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. 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 formal application is advisable for such proposals.

Target 3 Conserve the following community types in a natural condition: Intertidal reef community complex; *Laminaria*-dominated community complex and Subtidal reef with echinoderms and faunal turf community complex.

- A semi-quantitative description of the communities has been provided in **Section 1**.
- An interpolation of their likely distribution is provided in **Figure 3**.
- The estimated areas of the communities within the Reefs habitat given below are based on spatial interpolation and therefore should be considered indicative. In addition, as this habitat contains significant areas of sheer and steeply sloping rock, the mapped community extents will be underestimated:
 - Intertidal reef community complex – 56ha
 - *Laminaria*-dominated community complex – 1260ha
 - Subtidal reef with echinoderms and faunal turf community complex – 756ha
- 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.
- Significant continuous or ongoing disturbance of communities should not exceed an approximate area of 15% of the interpolated area of each community type, at which point an interdepartmental management review is recommended prior to further licensing of such activities.
- Proposed activities or operations that cause significant disturbance to communities but may not necessarily represent a continuous or ongoing

source of disturbance over time and space may 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.

Objective **To maintain the Favourable conservation condition of Submerged or partially submerged sea caves (EU habitat code 8330) in Tory Island Coast SAC, which is defined by the following list of attributes and targets**

Target 1	The distribution of sea caves occurring in the site is stable, subject to natural processes.
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- The likely distribution of sea caves in this SAC is indicated in **Figure 2**.
- This target refers to activities or operations that propose to permanently remove sea cave habitat thus reducing the range over which this habitat occurs within the site. It does not refer to long or short term disturbance of the biology of sea cave habitats
- Early consultation or scoping with the Department in advance of formal application is advisable for such proposals.

Target 2	Conserve the sea cave community types in a natural condition.
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- An indicative description of this community complex has been provided in **Section 1**.
- This target relates to the Structure and Function of the sea cave and therefore it is of relevance to those activities that may cause disturbance to the ecology of the habitat.
- Proposed activities or operations that cause significant disturbance to communities but may not necessarily represent a continuous or ongoing source of disturbance over time and space may 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.

Target 3	Human activities should occur at levels that do not adversely affect the ecology of sea caves in this SAC.
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- This target relates to proposed activities or operations that may result in the deterioration of key resources (*e.g.* water quality) that are likely to drive or influence community structure of sea caves in the site. In the absence of complete knowledge on these elements in this site, such considerations should be assessed where appropriate on a case-by-case basis.

Bibliography

MERC (2012). Intertidal and subtidal reef survey of Tory Island Coast SAC. Carried out by MERC on behalf of the Marine Institute in partnership with National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Picton, B.E. and Costello M.J. (1997). The BioMar biotope viewer: a guide to marine habitats, fauna and flora in Britain and Ireland, Environmental Sciences Unit, Trinity College, Dublin.

Figure 1. Extent of Reefs in Tory Island Coast SAC

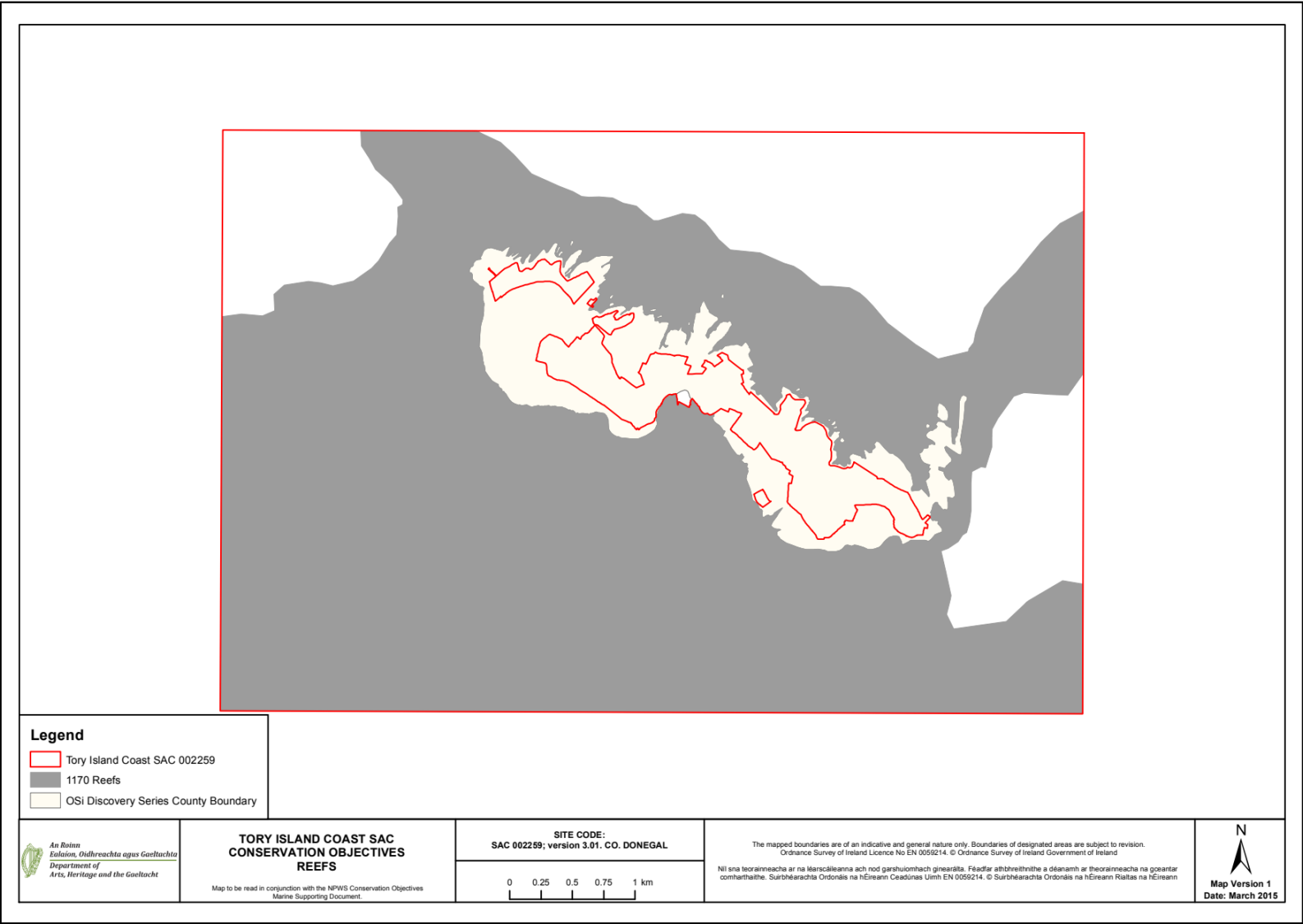


Figure 2. The potential distribution of Submerged or partially submerged sea caves in Tory Island Coast SAC

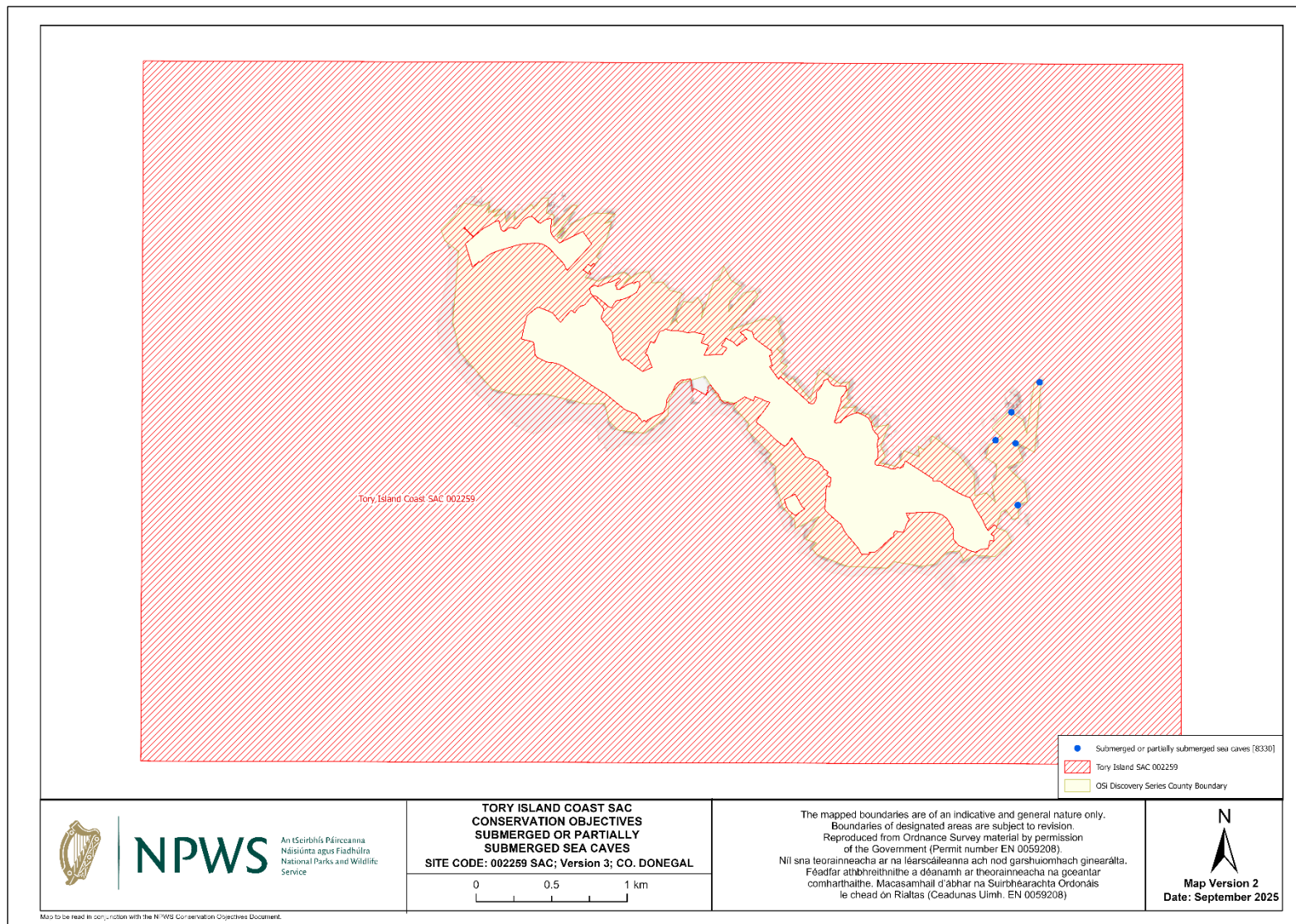


Figure 3. Distribution of marine community types in Tory Island Coast SAC

