NPWS

Broadhaven Bay SAC
(site code: 472)

Conservation objectives supporting document - Marine Habitats

Version 1

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Introduction

Broadhaven Bay SAC is designated for the marine Annex I qualifying interest of Mudflats and sandflats not covered by seawater at low tide, Reefs, Large shallow inlets and bays and Submerged or partially submerged sea caves (Figure 1, 2, 3 and 4). The Annex I habitat Large shallow inlets and bays is a large physiographic feature that may wholly or partly incorporate other Annex I habitats including, Mudflats and sandflats, Reefs and Sea caves within its area.

Intertidal and subtidal surveys were undertaken in 2009 and 2010 (RPS, 2013 and Aquafact, 2010a and b). A dive survey was undertaken in 2007 to map the sensitive communities within the bay (MERC, 2007). As part of the 1994 BioMar survey of this area two sea caves were surveyed (Picton & Costello, 1997). These data were used to determine the physical and biological nature of this SAC and the overlapping Special Protection Area: Blacksod Bay/Broadhaven SPA (site code 4037).

The distribution and ecology of intertidal or subtidal seacaves has not previously been the subject of scientific investigation in Ireland and the extents of very few individual caves have been mapped in detail. Analysis of the imagery from the Department of Communications, Marine and Natural Resources coastal oblique aerial survey yielded some information concerning the expected location of partly submerged seacaves in Broadhaven Bay SAC (Figure 4). There is no additional information available concerning the likely distribution of permanently submerged seacaves in the site at present. Whilst surveys undertaken in the UK indicate the structure and functions of seacaves 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 habitat 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 site 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 Broadhaven Bay SAC, eight community types are recorded. Their occurrence within the Annex I habitats and the overlapping SPA is presented in table 1; a description of each community type is given below.

Community Type	SAC Annex I Habitats				SPA
	Large shallow inlets and bays (1160)	Mudflats and sandflats not covered by seawater at low tide (1140)	Reefs (1170)	Submerged or partially submerged sea caves (8330)	
Coarse sediment to sandy mud with *Pygospio elegans* community complex	✓	✓			✓
Sand with *Angulus tenuis* community complex	✓	✓			✓
Sand to coarse sediment with crustaceans and *Polyophthalmus pictus* community complex	✓				✓
Subtidal sand with polychaetes community complex	✓				✓
Zostera-dominated community	✓				✓
Shingle	✓				✓
Fucoid-dominated reef community complex	✓		✓		✓
Subtidal reef community complex	✓		✓	✓	

Table 1 The community types recorded in Broadhaven Bay SAC and their occurrence in the Annex I habitats and the overlapping SPA.

Estimated area of each community type within the Annex I habitats is based on interpolation, and is 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 Broadhaven Bay 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.

COARSE SEDIMENT TO SANDY MUD WITH *PYGOSPIO ELEGANS* COMMUNITY COMPLEX

This community complex is recorded in the inner reaches of Broadhaven Bay at Belmullet and in Moyrahan Bay and west to Moynahan Point. In this inner bay it occurs from Inishderry Island to south of Inver. It is recorded in the inner reaches of Traw-Kirtaun, Blind Harbour and the inlet to the east of Ross Port Village and between Dooncarton and Binroe Point; it occurs extensively in Sruwaddacon Bay (Figure 5). It is recorded from the intertidal to the shallow subtidal (approximately 3m depth).

The sediment within the complex is variable. Coarse to mixed sediment occurs in parts of Sruwaddacon Bay and Traw-Kirtaun and at Knocknalina with coarse material (gravel, very coarse sand and coarse sand) ranging from 8.13% to 45.06% and medium and fine sand ranging from 25.0% to 44.8% and 16.5% and 44.6% respectively. Elsewhere, fine sand accounts for the major proportion of the sediment, however in the inner reaches of the bay at Belmullet and in Moyrahan Bay silt-clay comprises between 35% and 40% of the sediment fractions while coarser material accounts for less than 4%.

This community complex in general has low species diversity and abundances and is distinguished by the polychaetes *Pygospio elegans* and *Capitella* sp. and the oligochaete *Tubificoides benedii* (Table 2). *P. elegans* reaches moderate abundances at Knocknalina but is recorded elsewhere in low abundances, while *Capitella* sp. is recorded in moderate abundances in those areas where the sediment has a high silt-clay. Where *T. benedii* occurs, it is recorded in low abundances.

The polychaete *Arenicola marina* is recorded throughout the complex in moderate to low densities ($<5m^{-2}$). The bivalve *Cerastoderma edule* is recorded from Traw-Kirtaun and Knocknalina, with high densities ($>20m^{-2}$) being recorded in the outer part of Traw-Kirtaun. Feeding siphons of the bivalve *Ensis* sp. were also observed at Knocknalina.

Distinguishing species of the Coarse sediment to sandy mud with *Pygospio elegans* community complex	
Pygospio elegans	*Arenicola marina*
Capitella sp.	*Tubificoides benedii*

Table 2 Distinguishing species of the Coarse sediment to sandy mud with *Pygospio elegans* community complex.

SAND WITH *ANGULUS TENUIS* COMMUNITY COMPLEX

This intertidal community complex is recorded in the inner reaches of Broadhaven Bay in the centre of the bay around Inishderry, on the southern shore from Pickle Point to Rinnashinnagh and into Traw-Kirtaun and on the western shore at Shanaghy Point. On the eastern shore it is recorded at Inver and extensively in the inlet to the east of Ross Port Village in and the outer reaches of Sruwaddacon Bay and Blind Harbour (Figure 5). It occurs from the intertidal into the shallow subtidal to a depth of 3m.

The sediment is that of medium to fine sand (ranging from 16.3% to 82.3% and 7.4% to 69.3%, respectively); silt-clay and gravel are low (<3%) and negligible, respectively.

The distinguishing species of this community complex are the bivalve *Angulus tenuis*, the polychaete *Nephtys cirrosa* and the amphipod *Urothoe brevicornis* (Table 3). *A. tenuis* occurs in low abundances throughout the community complex. *N. cirrosa* and *U. brevicornis* are not uniformly distributed within the community complex and where they occur abundances are low.

The polychaete *Arenicola marina* is recorded in moderate densities ($2m^{-2}$) at Rinnashinnagh, Inver, Binroe Point and in inner Blind Harbour.

Distinguishing species of the Sand with *Angulus tenuis* community complex	
Angulus tenuis	*Urothoe brevicornis*
Nephtys cirrosa	

Table 3 Distinguishing species of the Sand with *Angulus tenuis* community complex.

SAND TO COARSE SEDIMENT WITH CRUSTACEANS AND *POLYOPHTHALMUS PICTUS* COMMUNITY COMPLEX

This community complex is recorded within this site from the outer reaches of Moyrahan Bay to Gubacashel (Figure 5). It occurs at depths of between 0m and 2m.

The sediment here varies from medium to fine sand (12.4% to 66.3% and 4.4% to 71.0%, respectively) in the inner bay to coarse sediment (5.3% to 16.7% and 4.2% to 10.6% gravel and coarse sand, respectively) at the northern extreme of the complex.

The distinguishing species are the crustaceans *Cheirocratus* sp., *Cheirocratus intermedius*, *Pariambus typicus, Caprella acanthifera*, *Urothoe elegans*, *Microdeutopus* sp. *Microdeutopus versiculatus* and *Crassicorophium crassicorne* and the polychaete *Polyophthalmus pictus* (Table 4).

Cheirocratus sp. and *C. intermedius* occur in high to moderate abundances and moderate abundance respectively throughout the complex, *P. pictus* is recorded in high abundances in the channel at Barrett Point and adjacent to the large *Zostera* beds in the inner reaches of the bay. *P. typicus* is also recorded in high abundances in the vicinity of these *Zostera* beds but occurs in moderate to low abundances elsewhere. *C. acanthifera*, *U. elegans*, *Microdeutopus* sp. and *M. versiculatus* are not uniformly distributed within the complex. *M. versiculatus* occurs in high abundance in the channel off Barrett Point and in low abundance elsewhere within the complex. *C. acanthifera*, *U. elegans*, *Microdeutopus* sp. and *Crassicorophium crassicorne* occur in high to moderate abundances off Barrett Point and around the *Zostera* beds in the inner bay but are not recorded in the more northern reaches of the complex.

Distinguishing species of the Sand to coarse sediment with crustaceans and *Polyophthalmus pictus* community complex	
Cheirocratus sp.	*Crassicorophium crassicorne*
C. intermedius	*Caprella acanthifera*
Polyophthalmus pictus	*Urothoe elegans*
Pariambus typicus	*Microdeutopus versiculatus*
Microdeutopus sp.	

Table 4 Distinguishing species of the Sand to coarse sediment with crustaceans and *Polyophthalmus pictus* community complex.

SUBTIDAL SAND WITH POLYCHAETES COMMUNITY COMPLEX

This subtidal community complex occurs extensively in the outer reaches of Broadhaven Bay, it extends into the inner bay as far as Knocknalina (Figure 5). It is recorded from depths of between 2m to 60m.

The sediment here is that of fine sand (ranging from 38.7% to 82.3%); gravel, very coarse sand and silt-clay are negligible (<1%) with coarse sand being less than 5% of the sediment fractions. The proportion of medium sand is highest in the outer bay in the northwest of the site; here it ranges from 21.3% to 64.2% compared to between 2.2% and 16% elsewhere.

The distinguishing species of this complex are the polychaetes *Spiophanes bombyx*, *Nephtys cirrosa* and *Magelona filiformis*, the bivalve *Chamelea striatula* and unidentified nemerteans. All of these species, with the exception of *N. cirrosa*, are recorded in high abundances in the outer bay between Danish Cellar and Duveel Point and also to the west of Kid Island; where these species occur elsewhere within the complex they are recorded in low abundances. The polychaetes *Chaetozone christiei* and *Spiochaetopterus typicus* are similarly distributed. *N. cirrosa* is recorded in moderate abundances north of Dooncarton and where it is recorded elsewhere within the complex it occurs in low abundances (Table 5).

Distinguishing species of the Subtidal sand with polychaetes community complex	
Spiophanes bombyx	*Magelona filiformis*
Chamelea striatula	*Chaetozone christiei*
Nephtys cirrosa	*Spiochaetopterus typicus*
Nemertea indet.	

Table 5 Distinguishing species of the Subtidal sand with polychaetes community complex.

A variant of this complex occurs to the south of Glash Island and to the north of Erris Head. The sediment here is coarser with coarse sand from and medium sand ranging from 42.5% to 46% 39.1% to 45% respectively. Gravel and fine material are negligible (<0.8% and <0.2%, respectively) and fine sand accounts for less the 7% of the sediment fractions. The polychaetes *Pisione remota* and *Polygordius lacteus* are recorded here in low abundances.

ZOSTERA-DOMINATED COMMUNITY

This community occurs in the inner bay from north of Knocknalina to Shanaghy Point and off Moynahan Point; it occurs off the eastern shore of the channel at Inver (Figure 5). It is recorded on a sandy substrate in water depths of between 0m to 5m.

Within this community the density of the seagrass *Zostera marina* varies from abundant (12 individuals per m^2) to frequent (6-11 individuals per m^2). The anemones *Anemonia viridis*, *Anthopleura ballii* and *Cereus pedunculatus*, the crustaceans *Necora puber* and *Pagurus bernhardus*, the polychaete *Lanice conchilega*, the gastropod *Turritella communis* and the sand goby *Pomatoschistus minutus* are all recorded here (Table 6).

Species associated with the *Zostera*-dominated community	
Zostera marina	*Cereus pedunculatus*
Anemonia viridis	*Pomatoschistus minutus*
Pagurus bernhardus	*Turritella communis*
Necora puber	*Lanice conchilega*
Anthopleura ballii	

Table 6 Species associated with the *Zostera*-dominated community.

SHINGLE

Shingle (pebbles and gravel) is recorded on the eastern shore of the inner bay at Inver, Rinnashinnagh and Derrynameel and at the outer reaches of Traw-Kirtaun. It occurs on the upper shore; talitrid amphipods being recorded where dead algae accumulate.

FUCOID-DOMINATED REEF COMMUNITY COMPLEX

This community complex occurs throughout Broadhaven Bay from the intertidal into the shallow subtidal to a depth of 2m. It occurs on exposed to moderately exposed coasts from Erris Head to Glash Island and from Binroe Point to Buddagh Island. It is recorded on sheltered coasts of the inner bay from Glash Island on its western shore to Ross Port on the eastern shore (Figure 5).

On sheltered to moderately exposed shores substrate is that of cobbles and boulders; on exposed coasts the substrate is bedrock.

The species associated with this community include unidentified lichens, the brown algae *Fucus vesiculosus*, *F. spiralis*, *Pelvetia canaliculata* and *Ascophyllum nodosum*, the gastropods *Patella vulgata* and *Littorina littorea*, the bivalve *Mytilus edulis* and barnacles including *Semibalanus balanoides* (Table 7). In sheltered to moderately exposed shores the community is dominated by the brown algae while on exposed coasts the bivalve *Mytilus edulis* and barnacles predominate.

Species associated with the Fucoid-dominated reef community complex	
Lichens indet.	*Patella vulgata*
Fucus vesiculosus	*Littorina littorea*
Fucus spiralis	*Mytilus edulis*
Pelvetia canaliculata	*Semibalanus balanoides*
Ascophyllum nodosum	Barnacles indet.

Table 7 Species associated with the Fucoid-dominated reef community complex.

SUBTIDAL REEF COMMUNITY COMPLEX

This community complex is recorded in the outer bay from Erris Head to Gubacashel in the west and from Benwee Head to Binroe Point in the east. It also occurs to the east of Brandy Point and in the centre of the outer bay between Ooghran Point and Doonanierin Point.

The exposure regime is that of exposed to moderately exposed reef and it is recorded in water depths of between 0m and 30m.

The substrate is primarily that of flat or sloping bedrock, occasionally with boulders and cobbles. Verticals reefs walls are recorded from Doonanierin Point to Rinnaglana and due east of Brandy Point; boulder and cobble substrate is recorded between Kid Island and the shore and in the inlets due east of Kid Island. It also occurs off Doonanierin Point and Binroe and in the western margin of the site at Gubastuckaun.

The species associated with this community complex are the kelp *Laminaria hyperborea*, the sponges *Cliona celata*, *Polymastia mamillaris*, the hydroid *Nemertesia antennina*, the anthozoans *Alcyonium digitatum*, *Caryophyllis* (*Caryophyllis*) *smithii*, *Urticina felina* and *Corynactis viridis* and the gastropod *Calliostoma zizyphinum* (Table 8). This community complex exhibits a typical reef continuum with the shallow depths (<15m) dominated by dense stands of the kelp species *L. hyperborea* which become less dense with increasing depth and are absent below 25m. In deeper water (>25m) the sponges *Dysidea fragilis*, *Polymastia boletiformis*, *Stelligera stuposa*, *Haliclona* (*Rhizoniera*) *viscosa*, *Pachymatisma johnstonia*, *Raspailia* (*Clathriodendron*) *hispida*, *Raspailia* (*Raspailia*) *ramosa*, *Axinella infundibuliformis* and *Tethya aurantium*, the hydroids *Sertularella gayi* and *Nemertesia ramosa*, the bryozoan *Porella compressa*, the soft coral *Alcyonium glomeratum*, the nudibranch *Cadlina laevis* and the echinoderm *Aslia lefevrii* are recorded. To the southeast of Binroe Point the kelp *Saccharina latissima* and unidentified foliose red algae are recorded. The echinoderms *Marthasterias glacialis*, *Asterias rubens*, *Echinus esculentus* and *Holothuria* (*Panningothuria*) *forskali* are widespread throughout the community.

A number of notable species are recorded from this community. The uncommon crustacean *Pirimela denticulata* is recorded from the east of the site in relatively shallow water (11m), while in the northwest in deeper waters (35m) the hydroid *Tamarisca tamarisca* occurs.

Species associated with the Subtidal reef community complex	
Laminaria hyperborea	*Caryophyllis* (*Caryophyllis*) *smithii*
Cliona celata	*Urticina felina*
Polymastia mamillaris	*Corynactis viridis*
Nemertesia antennina	*Calliostoma zizyphinum*
Alcyonium digitatum	

Table 8 Species associated with the Subtidal reef community complex.

A variant of this community is recorded from two of the sea caves which were investigated during the BioMar survey. The fauna is recorded from the roof, vertical walls and overhangs within the caves. The depth within the caves does not exceed 5m. A wide variety of sponge species are recorded with unidentified encrusting sponges and *Leuconia nivea* being recorded as abundant, while *Clathrina coriacea, Pachymatisma johnstonia, Thymosia guernei, Hymeniacidon perleve, Dysidea fragilis* and *Alysilla sulfurea* as frequent. The anthozoans *Corynactis viridis, Caryophyllis* (*Caryophyllis*) *smithii* and *Urticina felina,* the bryozoan *Crisia denticulata, Crisia eburnea* and *Cradoscrupocellaria reptans* are recorded as frequent or abundant here. The ascidian *Dendrodoa grossularia* is recorded as common to frequent within the caves.

Section 2

Appropriate Assessment Notes

Many operations/activities of a particular nature and/or size require the preparation of an environmental impact statement of the likely effects of their planned development. While smaller operations/activities (i.e. sub threshold developments) are not required to prepare such statements, an appropriate assessment and Natura Impact Statement is required to inform the decision-making process in or adjacent to Natura 2000 sites. The purpose of such an assessment is to record in a transparent and reasoned manner the likely effects on a Natura 2000 site of a proposed development. General guidance on the completion of such assessments has been prepared and is available at www.npws.ie.

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 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 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 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 habitats to facilitate the appropriate assessment process:

Objective **To maintain the favourable conservation condition of Large shallow inlets and bays in Broadhaven Bay 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.

- This habitat also encompasses the Annex I habitats Mudflats and sandflats not covered by sea water at low tide, Reefs and Submerged or partially submerged sea caves. Targets for these habitats should be addressed in their own right.
- 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	Maintain the extent of the *Zostera*-dominated community, subject to natural processes.

- A *Zostera*-dominated community is considered to be a keystone community that is of considerable importance to the overall ecology and biodiversity of a habitat by virtue of its physical complexity, e.g. it serves as important nursery grounds for commercial and non-commercial species.
- Any significant anthropogenic disturbance to the extent of this community should be avoided.

- An interpolation of the likely distribution of this community is provided in figure 5. The area given below is based on spatial interpolation and therefore should be considered indicative:
    - *Zostera*-dominated community - 53ha

Target 3	Conserve the high quality of *Zostera*-dominated community, subject to natural processes.

- It is important to ensure the quality as well as the extent of the *Zostera*-dominated community is conserved. For example, shoot density can provide an indication of the habitat quality as well as giving information on the habitat complexity and refuge capability; all important components in maintaining the structural and functional integrity of the habitat.
- Within this SAC, the density of *Zostera* in 2007 was estimated to range from frequent to abundant on the DAFOR scale (semi-quantitative abundance measure).
- Any significant anthropogenic disturbance to the quality (i.e. shoot density) of this community should be avoided.

Target 4	Conserve the following community types in a natural condition: Coarse sediment to sandy mud with *Pygospio elegans* community complex; Sand with *Angulus tenuis* community complex; Sand to coarse sediment with crustaceans and *Polyophthalmus pictus* community complex; Subtidal sand with polychaetes community complex; Fucoid-dominated reef community complex and Subtidal reef 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 5.
- The estimated areas of these communities given below are based on spatial interpolation and therefore should be considered indicative:
    - Coarse sediment to sandy mud with *Pygospio elegans* community complex - 415ha
    - Sand with *Angulus tenuis* community complex - 399ha
    - Sand to coarse sediment with crustaceans and *Polyophthalmus pictus* community complex - 549ha
    - Subtidal sand with polychaetes community complex – 6196ha
    - Fucoid-dominated reef community complex - 170ha
    - Subtidal reef community complex - 876ha
    - Shingle – 14ha
- 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 inter-Departmental 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.
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Objective **To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Broadhaven Bay 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.

- This target refers to activities or operations that propose to permanently remove habitat from a 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	Conserve the following community types in a natural condition: Coarse sediment to sandy mud with *Pygospio elegans* community complex and Sand with *Angulus tenuis* community complex.

- A semi-quantitative description of these community types has been provided in Section 1.
- An interpolation of their likely distribution is provided in figure 5.
- The estimated areas of these community types within the Mudflats and sandflats not covered by seawater at low tide habitat given below are based on spatial interpolation and therefore should be considered indicative:
  - Coarse sediment to sandy mud with *Pygospio elegans* community complex - 335ha
  - Sand with *Angulus tenuis* community complex – 160ha
- 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 inter-Departmental 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 Reefs in Broadhaven Bay 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.

- 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 3.
- 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: Fucoid-dominated reef community complex and Subtidal reef 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 5.
- 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:
  - Fucoid-dominated reef community complex - 184ha
  - Subtidal reef community complex - 919ha
- 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 inter-Departmental 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 partly submerged sea caves in Blacksod Bay SAC, which is defined by the following list of attributes and targets**

Target 1	The distribution of sea caves is stable, subject to natural processes.

- The distribution of all sea caves in this SAC has not yet been fully evaluated (Figure 4).
- 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	Human activities should occur at levels that do not adversely affect the ecology of sea caves at the site.

- 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.

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MERC (2007). Survey of sensitive subtidal benthic marine communities carried out in Roaringwater Bay and Islands SAC, Lough Hyne Nature Reserve and Environs SAC, Valentia Harbour and Portmagee Channel SAC and Broadhaven Bay SAC. Carried out by MERC on behalf of National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.

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Figure 1. Extent of Large shallow inlets and bays in Broadhaven Bay SAC

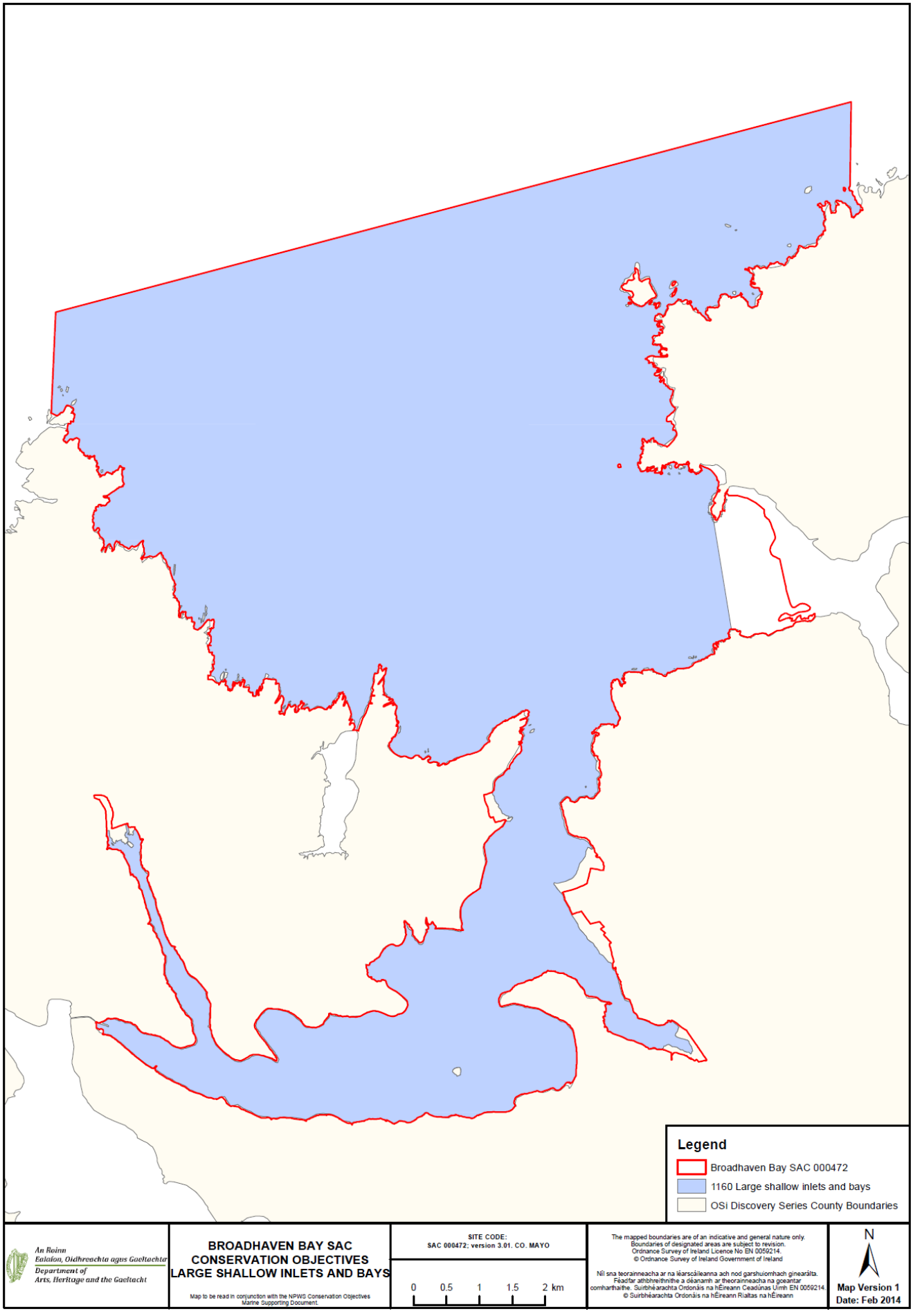

Figure 2. Extent of Mudflats and sandflats not covered by seawater at low tide in Broadhaven Bay SAC

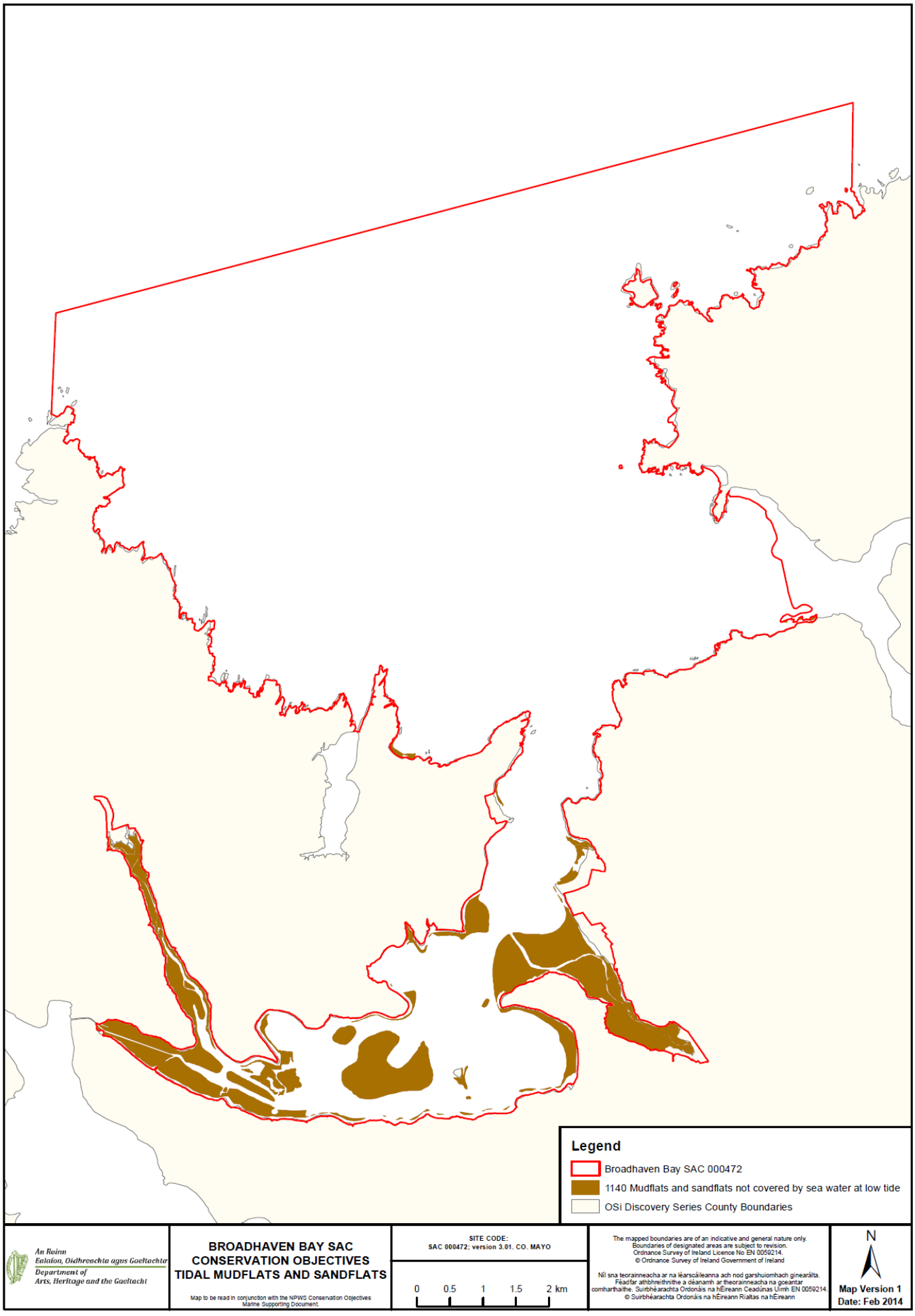

Figure 3. Extent of Reefs in Broadhaven Bay SAC

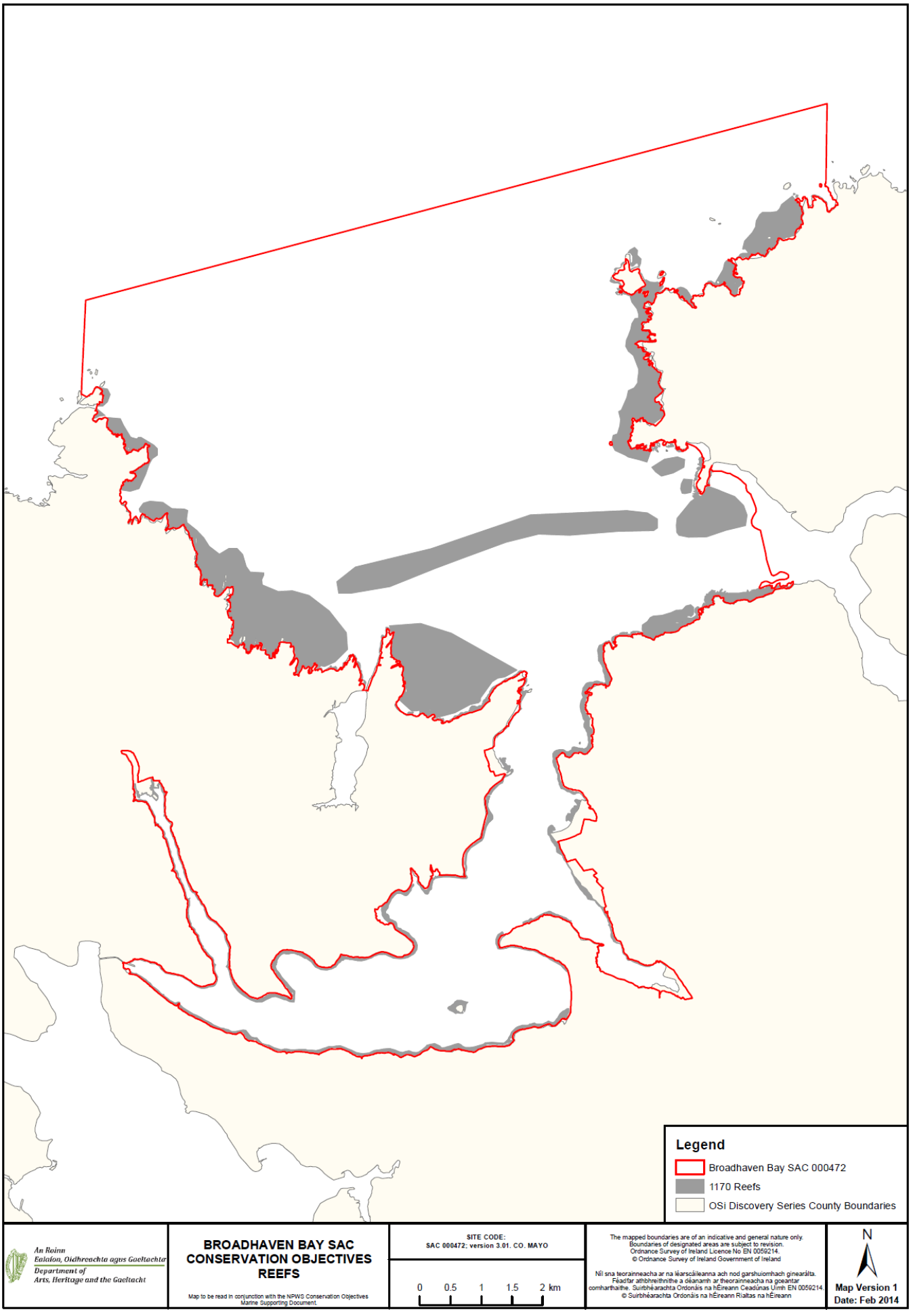

Figure 4. The expected distribution of seacaves in Broadhaven Bay SAC

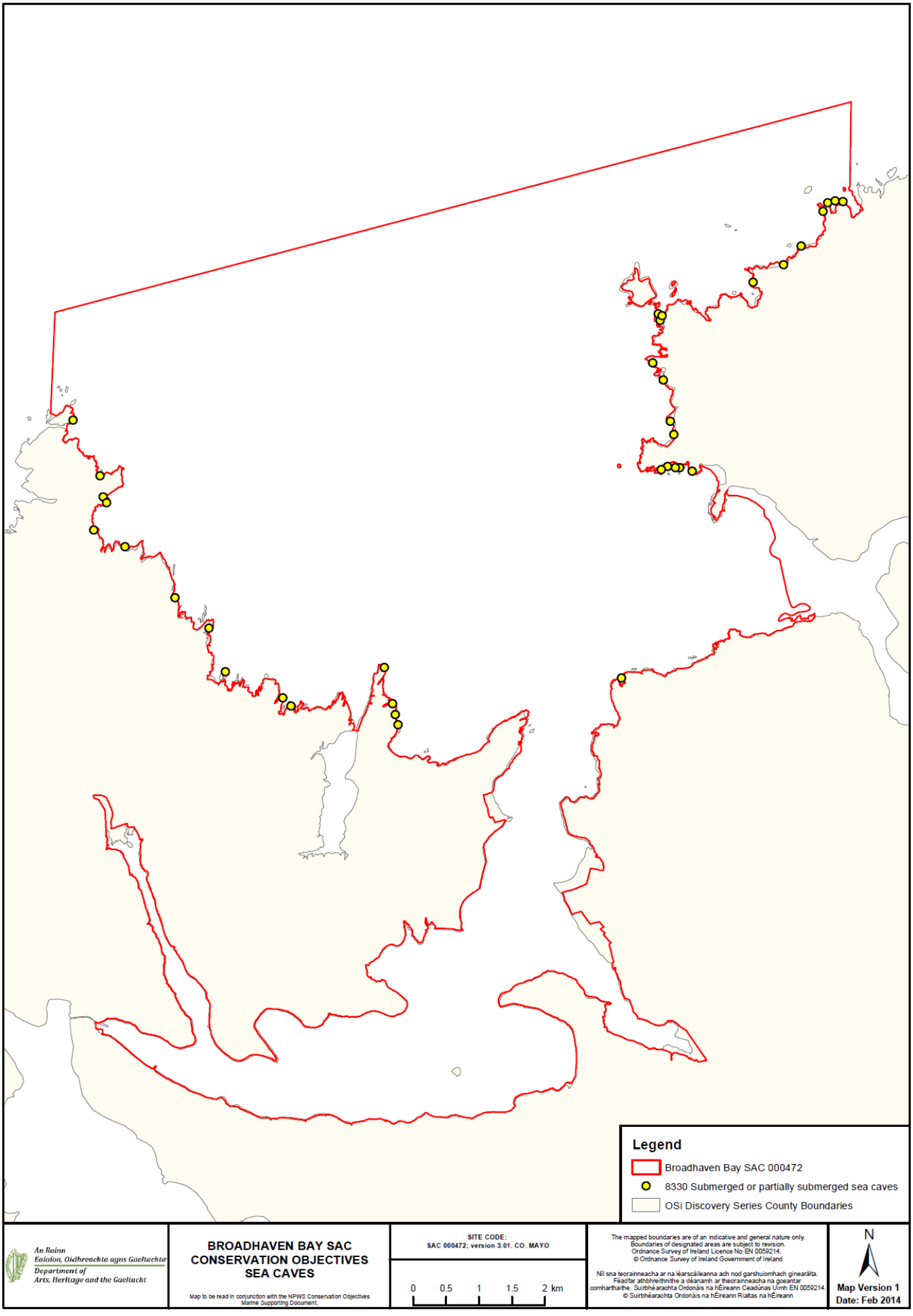

Figure 5. Distribution of community types in Broadhaven Bay SAC