NPWS

Kilkee Reefs SAC
(site code: 2264)

Conservation objectives supporting document -
Marine Habitats

Version 1

July 2014

Introduction

Kilkee Reefs SAC is designated for the marine Annex I qualifying interests of Large shallow inlets and bays, Reefs and Submerged or partially submerged sea caves (Figures 1, 2 and 3). 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 reefs and sea caves within its area.

A BioMar survey of this site was carried out in 1996 (Picton and Costello, 1997) and intertidal and subtidal surveys were undertaken in 2012 and 2011, respectively (MERC, 2012a and b); these data were used to determine the physical and biological nature of this SAC.

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 Kilkee Reefs SAC (Figure 3). 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 the Kilkee Reefs SAC three community types are recorded. The Annex I habitats in which they are recorded is presented in table 1, a description of each community type is given below.

	Habitats		
	Large shallow inlets and bays (1160)	Reefs (1170)	Submerged or partly submerged seacaves (8330)
Sediment community complex	✓		
Exposed intertidal reef community complex	✓	✓	
Exposed subtidal reef community complex	✓	✓	✓

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

Estimated areas of each community type within the Annex I habitats, 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 Kilkee Reefs SAC 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.

SEDIMENT COMMUNITY COMPLEX

This community complex is recorded from the intertidal and shallow subtidal (<10m) in Moore Bay at Kilkee and at Ballard Bay (Figure 3).

The sediment of this complex is that of sand to coarse sediments. In general, fine sand predominates, particularly in the intertidal (ranging from 2.3% to 63.6%); medium sand ranges from 4.9% to 51.2% and coarse sand from 0.5% to 43.7% while very fine sand ranges from 0.2% to 33%. Gravel is generally negligible (<0.2%) with the exception of the mid shore (5.7%) and the shallow subtidal (22.86%). Silt-clay is negligible (<0.3%) within this complex.

The distinguishing species of this community complex are the crustaceans *Eurydice pulchra*, *Bathyporeia pelagica* and *Pontocrates arenarius* (Table 2). These species are not uniformly distributed throughout the complex but where they occur their abundances are low. *E. pulchra* and *B. pelagica* are recorded from the intertidal extent of the community while *P. arenarius* occurs subtidally.

Several other species occur in this complex but are limited in their distribution and where these species occur their abundances are low. On Kilkee beach the amphipod *Gammarus* sp., the polychaetes *Arenicola marina*, *Nephtys hombergii*, *Malacoceros fuliginosus*, *Capitella* sp., *Scolelepis* (*Scolelepis*) *squamata* and *S. foliosa* and unidentified nemerteans are recorded. The polychaetes *Sigalion* sp., *Nephtys* sp., *N. assimilis*, *N. cirrosa*, *Spiophanes bombyx*, *Magelona filiformis* and *Owenia fusiformis*, the crustaceans *Pontocrates altamarinus*, *Bathyporeia* sp. and *Iphinoe trispinosa* and the bivalve *Angulus fabula* occur in the shallow subtidal (<5m) and the gastropod *Euspira nitida* is recorded in deeper water (>5m).

The polychaete *Magelona johnstoni* occurs across the tidal interface but is more abundant subtidally.

Distinguishing species of Sediment community complex	
Eurydice pulchra	*Pontocrates arenarius*
Bathyporeia pelagica	

Table 2 Distinguishing species of Sediment community complex.

A variant of this community is likely to occur in deeper water (>50m).

EXPOSED INTERTIDAL REEF COMMUNITY COMPLEX

This exposed reef community occurs throughout the site from Carricknacleara in the north to Bealanglass Bay in the south (Figure 3).

The substrate here is sloping bedrock in the form of extensive platforms with crevices and ledges. Vertical rock faces occur on some of the more exposed headlands within the site.

The species associated with this community are the lichens *Xanthoria parietina*, *Verrucaria maura* and *Tephromela atra*, the gastropod *Patella vulgata*, the brown algae *Himanthalia elongata* and *Fucus serratus*, the red algae *Osmundea pinnatifida* and *Jania rubens* and the bivalve *Mytilus edulis* (Table 3).

The brown alga *Pelvetia canaliculata* and the fungus *Lichina pygmaea* are frequently recorded on the upper shore and the gastropods *Melarhaphe neritoides* and *Nucella lapillus* also occur

here. The barnacles *Chthamalus montagui* and *C. stellatus*, the brown alga *Fucus vesiculosus* and the gastropod *Gibbula cineraria* are recorded from the mid shore. The barnacle *Semibalanus balanoides* occurs on the mid to low shore. The brown algae *Laminaria digitata* and *Alaria esculenta* are recorded from the sublittoral fringe while surge gullies exhibit a rich faunal turf dominated by the hydroid *Tubularia indivisa* and the anemone *Corynactis viridis*. Cracks and crevices provide shelter for the anemone *Actinia equina* and the gastropod *Littorina saxatilis*. The brown algae *Saccharina latissima* and *Bifurcaria bifurcata* with an understory of encrusting calcareous red alga and *Corallina officinalis* are recorded from rock pools.

Species associated with the Exposed intertidal reef community complex	
Xanthoria parietina	*Fucus serratus*
Verrucaria maura	*Osmundea pinnatifida*
Tephromela atra	*Jania rubens*
Patella vulgata	*Mytilus edulis*
Himanthalia elongata	

Table 3 Species associated with the Exposed intertidal reef community complex.

EXPOSED SUBTIDAL REEF COMMUNITY COMPLEX

This reef community complex occurs in exposed conditions throughout the site from Carricknacleara in the north to Bealanglass Bay in the south in water depths of 0-55m (Figure 3).

In shallower waters (<30m) the community occurs on a substrate of sloping bedrock; vertical rock walls which drop into 40m or more water depth are recorded at Poulnagun, Foohagh Point, Kilkee and north of George's Head. In deeper waters, the substrate is primarily cobbles and boulders interspersed with coarse sediments.

This community complex has dense stands of *Laminaria hyperborea* which become sparser with increasing depth and are replaced by sponges. The species associated with this community complex are the kelp *Laminaria hyperborea*, the red algae *Delesseria sanguinea*, *Hypoglossum hypoglossoides*, *Plocamium cartilagineum* and *Delesseria sanguinea*, the echinoderms *Holothuria* (*Panningothuria*) *forskali*, *Marthasterias glacialis*, *Aslia lefevrii*, *Asterias rubens* and *Echinus esculentus* and the gastropod *Calliostoma zizyphinum*, the sponges *Axinella dissimilis*, *Cliona celata*, *Dysidea fragilis*, *Haliclona* (*Rhizoniera*) *viscosa*, *Hemimycale columella*, *Hymedesmia* (*Stylopus*) *coriacea*, *Myxilla* (*Myxilla*) *incrustans*, *Pachymatisma johnstonia*, *Polymastia boletiformis* and *Stelligera stuposa*, the bryozoan *Pentapora foliacea*, the ascidian *Clavelina lepadiformis*, the corals *Alcyonium digitatum*, *Caryophyllia* (*Caryophyllia*) *smithii* and *Eunicella verrucosa* and the anemone *Urticina felina*.

The anemone *Corynactis viridis* and the bryozoans *Scrupocellaria scruposa* and *Crisia eburnea* occur on the subtidal bases of cliffs.

The density of *L. hyperborea* decreases with depth, as it thins, the brown alga *Dictyota dichotoma* becomes more common. The kelp understorey consists of the red algae *Delesseria sanguinea*, *Rhodymenia pseudopalmata*, *Heterosiphonia plumosa*, *Rhodophyllis divaricata*, *Hypoglossum hypoglossoides* and *Plocamium cartilagineum*, the echinoderms *Marthasterias glacialis* and *Asterias rubens* are recorded as occasional to frequent. Several other species including the red algae *Erythroglossum laciniatum*, *Callophyllis laciniata*, *Cryptopleura ramosa*, *Dilsea carnosa* and *Phycodrys rubens* are also recorded but are not uniformly distributed throughout the community. On the less exposed shallow reef in Moore Bay, the kelp species *Saccharina latissima* and *Saccorhiza polyschides* are recorded with the sand scour tolerant red algae *Polyides rotundus* and *Ahnfeltia plicata*.

In deeper water (>25m) the sponges *Axinella dissimilis*, *Dysidea fragilis*, *Haliclona* (*Rhizoniera*) *viscosa*, *Hemimycale columella*, *Hymedesmia* (*Stylopus*) *coriacea*, *Myxilla* (*Myxilla*) *incrustans*, *Polymastia boletiformis*, *Thymosia guernei* and *Stelligera stuposa*, the bryozoan *Pentapora foliacea*, the corals *Alcyonium digitatum*, *Caryophyllia* (*Caryophyllia*) *smithii* and *Eunicella verrucosa,* the anemones *Isozoanthus sulcatus* and *Urticina felina*, the echinoderm *Aslia lefevrii*, the nudibranch *Crimora papillata* and the red alga *Delesseria sanguinea* are recorded.

At depths of 31m to 36m there is a high diversity of Axinellid sponges including *Axinella damicornis*, *A. dissimilis*, *A. infundibuliformis* and *Phakellia vermiculata,* which is rare in shallow waters. The nudibranch *Tritonia nilsodhneri* is found grazing on the sea fan *Eunicella verrucosa*. The soft coral *Alcyonium glomeratum*, the hydroid *Gymnangium montagui* and the bryozoan *Porella compressa* are also recorded in association with the Axinellid sponges.

Several species occur across the reef continuum including the red algae *Delesseria sanguinea*, the echinoderms *Holothuria* (*Panningothuria*) *forskali* and *Echinus esculentus*, the gastropod *Calliostoma zizyphinum*, the ascidian *Clavelina lepadiformis* and the sponges *Cliona celata* and *Pachymatisma johnstonia*.

While no survey was undertaken of the sea caves at this site it is likely that the community within them would reflect the fauna of the surrounding deep (>25m) reef community dominated by sponges and anthozoans.

Species associated with the Exposed subtidal reef community complex	
Laminaria hyperborea	*Hemimycale columella*
Holothuria (*Panningothuria*) *forskali*	*Hymedesmia* (*Stylopus*) *coriacea*
Marthasterias glacialis	*Myxilla* (*Myxilla*) *incrustans*
Asterias rubens	*Pachymatisma johnstonia*
Calliostoma zizyphinum	*Polymastia boletiformis*
Delesseria sanguinea	*Stelligera stuposa*
Echinus esculentus	*Pentapora foliacea*
Hypoglossum hypoglossoides	*Clavelina lepadiformis*
Plocamium cartilagineum	*Alcyonium digitatum*
Axinella dissimilis	*Caryophyllia* (*Caryophyllia*) *smithii*
Cliona celata	*Eunicella verrucosa*
Dysidea fragilis	*Urticina felina*
Haliclona (*Rhizoniera*) *viscosa*	*Aslia lefevrii*

Table 4 Species associated with the Exposed subtidal reef community complex.

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 Kilkee Reefs 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 habitat Reefs. Targets for this habitat should be addressed in its 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	Conserve the following community types in a natural condition: Sediment community complex; Exposed intertidal reef community complex; Exposed subtidal 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 4.

- The estimated areas of these communities given below are based on spatial interpolation and therefore should be considered indicative:
    - Sediment community complex - 103ha
    - Exposed intertidal reef community complex - 69ha
    - Exposed subtidal reef community complex – 1170ha
- 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 Kilkee Reefs 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 2.
- 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: Exposed intertidal reef community complex; Exposed subtidal 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 4.
- 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:
  - Exposed intertidal reef community complex - 82ha
  - Exposed subtidal reef community complex –2310ha
- 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 partially submerged sea caves in Kilkee Reefs 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.

- The distribution of all sea caves in this SAC has not yet been fully evaluated (Figure 3).
- 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.

Bibliography:

MERC (2012a). Intertidal benthic survey and Intertidal reef survey of Kilkee Reefs 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.

MERC (2012b). Subtidal benthic survey and subtidal reef survey of Kilkee Reefs 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 Large shallow inlets and bays in Kilkee Reefs SAC

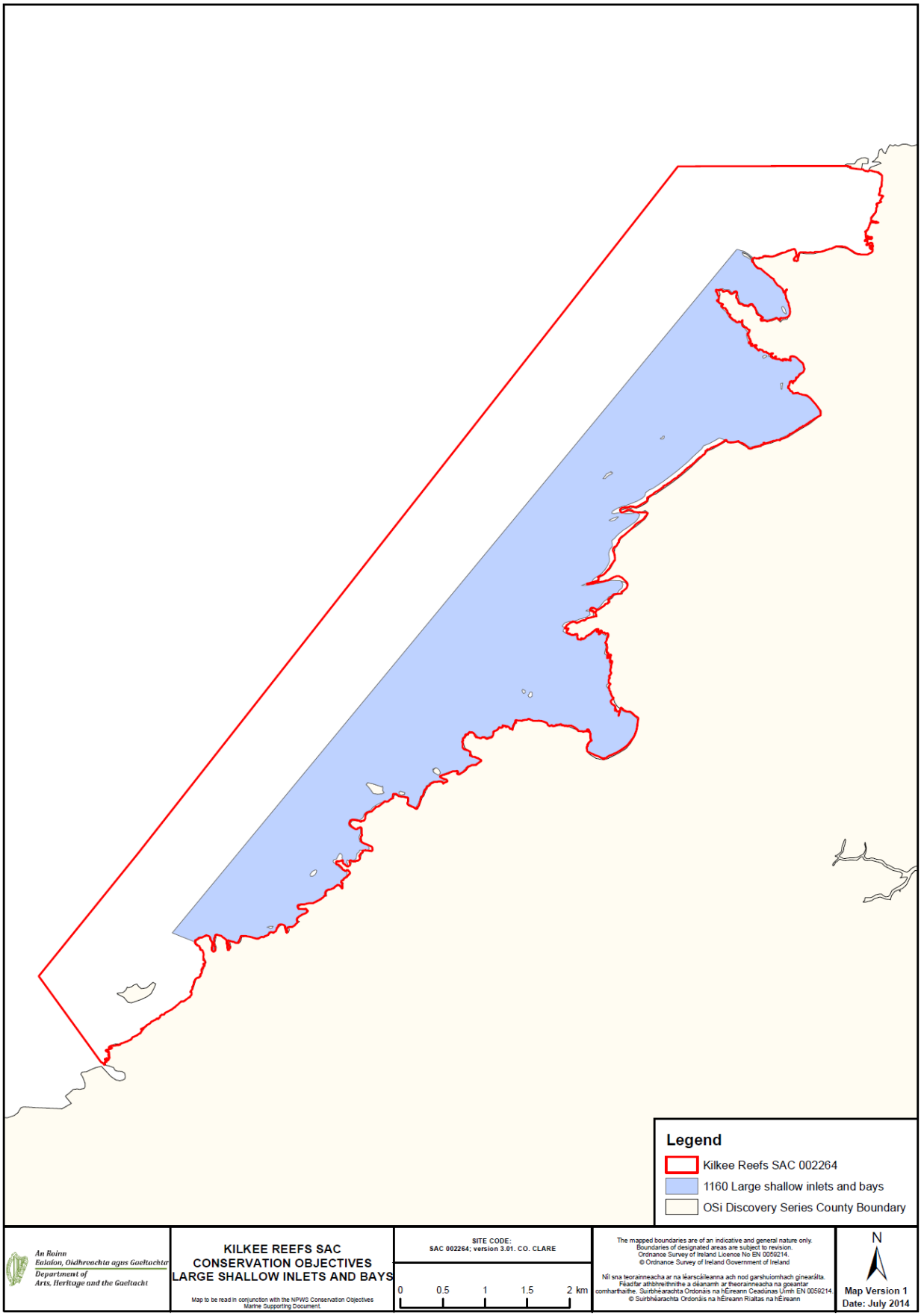

Figure 2. Extent of Reefs in Kilkee Reefs SAC

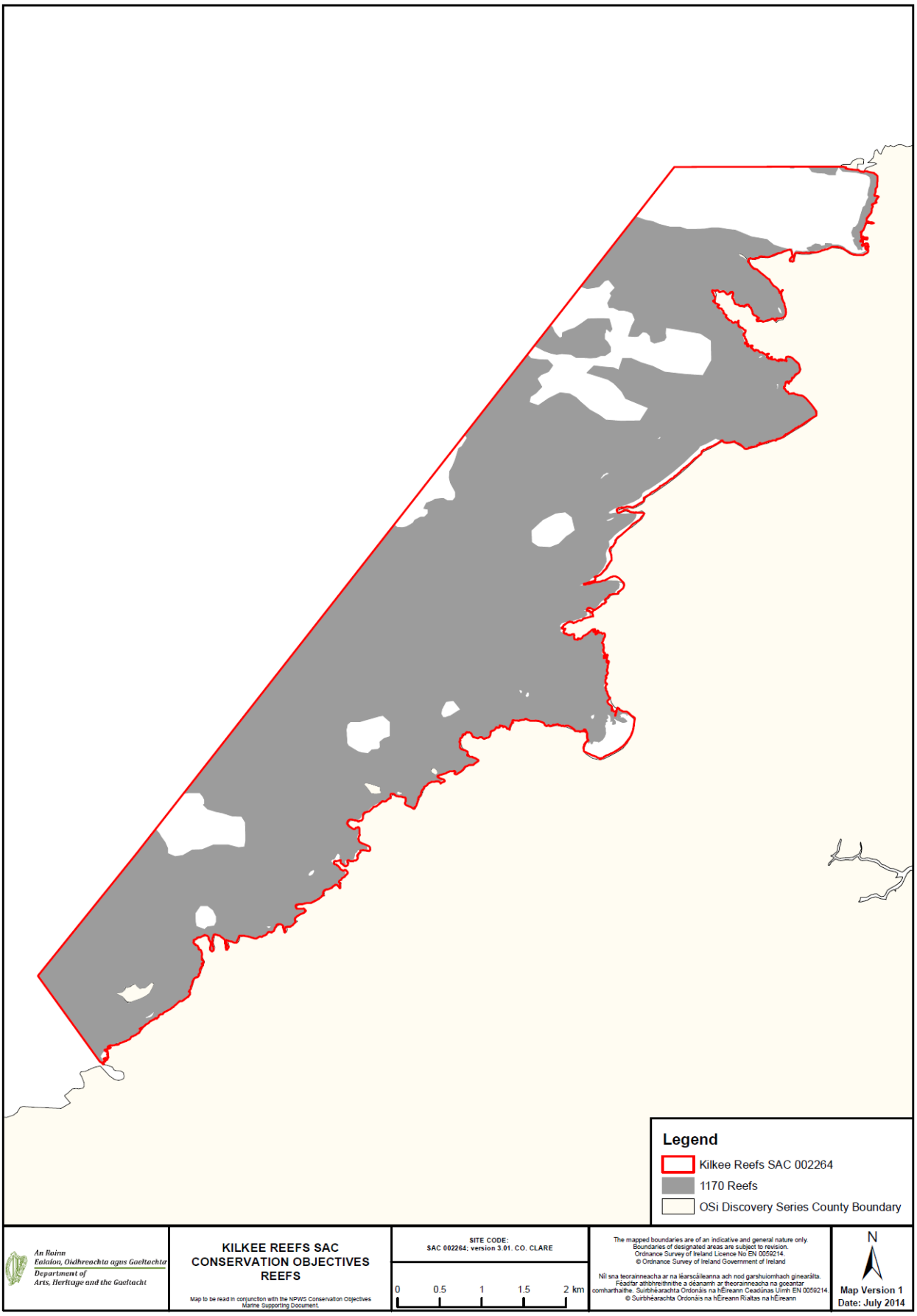

Figure 3. The expected distribution of seacaves in Kilkee Reefs SAC

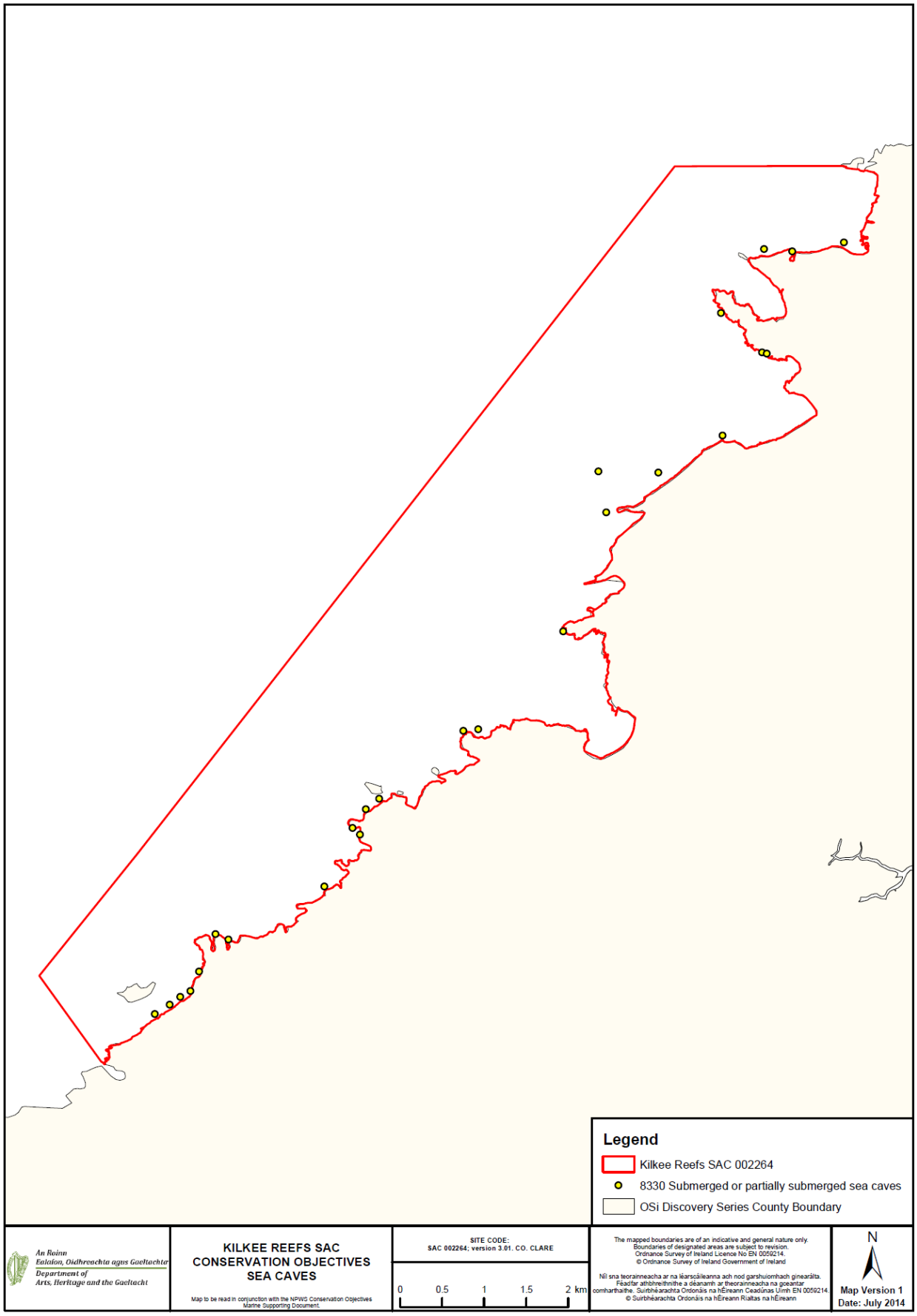

Figure 4. Distribution of community types in Kilkee Reefs SAC