NPWS (2011)

# Castlemaine Harbour (site code: 343)

## Conservation objectives supporting document - marine habitats

Version 2

## Introduction

Castlemaine Harbour SAC is designated for *inter alia* the Annex I qualifying interests of Mudflats and sandflats not covered by seawater at low tide and Estuaries. The Annex I habitat Estuaries is a large physiographic feature that may wholly or partly incorporate other Annex I habitats including mudflats and sandflats within its area (Figures 1 and 2).

A comprehensive intertidal sediment survey was undertaken in 2008 and a subtidal sediment survey was undertaken in 2009 to investigate the physical and biological structure of this SAC and adjacent areas that are contained within the Special Protection Area. Analysis of these data facilitated the development of site-specific conservation objectives that will allow Ireland deliver 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:

## MUDFLATS AND SANDFLATS NOT COVERED BY SEAWATER AT LOW TIDE.

A large expansive mudflat is present in inner Castlemaine Harbour, with smaller mudflats present in Rossbehy Creek (Figure 2). Sandflats occur along the length of Inch Beach and on both sides of the Rossbehy Pennisula. While some communities, namely the Fine to muddy fine sand with polychaetes community complex and the *Zostera* dominated community complex are also present the Estuaries Annex 1 habitat, they will be detailed under this habitat.

## INTERTIDAL MUDDY FINE SAND COMMUNITY COMPLEX

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 Castlemaine Harbour identified a series 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.

This community complex is recorded in the inner reaches of Castlemaine Harbour along the southern shore from the lower reaches of the Cromane Peninsula through to the northern shore to an area due west of Roscullen Island (Figure 3). It is also recorded along the northern shore at the leeward side of Inch Strand to Coumskrihaun. It occurs on the upper and mid shore area.

This soft mud has an anoxic layer at or close to the sediment surface. It varies in the proportion of fine material present; fine sand ranges from 4 to 84%, very fine sand from 4 to 49% and silt-clay from 1 to 88%.

The biological component is dominated by species indicative of estuarine conditions, notably *Tharyx* sp., *Hediste diversicolor* and *Polydora cornuta*, and the amphipods *Gammarus locusta* and *Corophium volutator.* Other species which occur in significant numbers here include the bivalve *Macoma balthica*, the oligochaete *Heterochaeta costata*, the polychaete *Pygospio elegans* and the crustacean *Crangon crangon*.

| Distinguishing species of the Intertidal muddy fine sand community complex | |
|---|---|
| *Tharyx* sp. A | *Macoma balthica* |
| *Polydora cornuta* | *Pygospio elegans* |
| *Hediste diversicolor* | *Heterochaeta costata* |
| *Gammarus locusta* | *Crangon crangon* |
| *Corophium volutator* | |

**Table 1** Distinguishing species of the Intertidal muddy fine sand community complex.

## INTERTIDAL SAND WITH *NEPHTYS CIRROSA COMMUNITY*

This community has been recorded from the intertidal upper, mid and low shore. It is recorded from the shores of the outer promontories of Castlemaine Harbour and Rossbehy Creek (Figure 3). The sediment is composed largely of fine sand (67-93%) with medium sand occasionally present in significant proportions (4-33%).

The polychaete *Nephtys cirrosa* is the only species which may be described a distinguishing species for this community. However, the crustacean *Bathyporeia pilosa* and the polychaete *Scolelepis squamata* may also be present and may reach moderate densities here.

## FINE TO MUDDY FINE SAND WITH POLYCHAETES COMMUNITY COMPLEX

This community complex is recorded from the upper shore through to the subtidal areas within Inner Castlemaine Harbour. It also occurs in the inner reaches of Rossbehy Creek and Caragh Creek. The sediment type is that of fine to muddy fine sand, with fine sand ranging from 31 to 96%, very fine sand from 4 to 30% and silt-clay from 0 to 34%. Medium sand may also be present in significant proportions (0-29%).

The biological component often supports high numbers of the polychaetes *Pygospio elegans*, *Eteone longa, Scoloplos armiger* and *Spio martinensis*. The following species may also occur in high abundances: the polychaete *Capitella capitata* and the bivalves *Macoma balthica* and *Angulus tenuis*.

| Distinguishing species of the Fine to muddy fine sand with polychaetes community complex | |
|---|---|
| *Pygospio elegans* | *Capitella capitata* |
| *Eteone longa* | *Macoma balthica* |
| *Scoloplos armiger* | *Angulus tenuis* |
| *Spio martinensis* | |

**Table 2** Distinguishing species of the Fine to muddy fine sand with polychaetes community complex.

### *ZOSTERA* DOMINATED COMMUNITY

A very large bed of *Zostera* spp. occurs intertidally due east of Inch Strand, two smaller beds occur in Rossbehy Creek and a single small bed occurs in the inner harbour at Laghtacallow Point. This community occurs on the upper and mid shore and is commonly in standing water.

### ESTUARIES

Estuary was considered to be the Transitional Water Body area as defined by the EPA under the Water Framework Directive. Its inner boundary in the northern channel occurs between Laghtacallow Point and Tincally Point, and in the southern channel it occurs at the quay to the east of Reen Point. The seaward boundary occurs due west of Rosbehy Point to Inch Point. See figure 1.

In addition to the above communities the following community complex also occurs within this Annex I habitat:

### MIXED SEDIMENT COMMUNITY COMPLEX

This community complex is restricted to the channel between Rossbehy Point and Inch Point. This is a predominantly medium (0.5-71%) to fine sand (1-69%) with varying proportions of gravel (0-44%).

The biological community incorporates both an infaunal and an epifaunal component, reflecting the presence of live mussel and associated shell debris overlaying the sand. The characterising epifaunal element includes the polychaete *Pomatoceros lamarckii*, and the amphipods *Corophium acherusicum*, *Caprella acanthifera* and *Jassa pusilla*. The characterising infaunal species are, in general, not as numerically abundant as the epifauna and include the polychaetes *Pholoe synophthalmica, Eumida sanguinea*, and *Nephtys cirrosa* and the bivalve *Angulus tenuis*.

| Distinguishing species of the Mixed sediment community complex | |
|---|---|
| *Mytilus edulis* | *Amphipholis squamata* |
| *Corophium acherusicum* | *Jassa pusilla* |
| *Caprella acanthifera* | *Eumida sanguinea* |
| *Pholoe synophthalmica* | *Nephtys cirrosa* |
| *Nemertea indet.* | *Ammothella longipes* |
| *Pomatoceros lamarckii* | *Angulus tenuis* |
| *Microprotopus maculatus* | *Gastrosaccus spinifer* |
| *Abludomelita obtusata* | |

**Table 3** Distinguishing species of the Mixed sediment community complex.

The following community is present in the western outer approaches to Castlemaine Harbour. It is not present in the SAC but lies within the boundary of the SPA.

## ADDITIONAL COMMUNITY OCCURRING WITH THE SPA ONLY

### FINE SAND WITH *DONAX VITTATUS* AND POLYCHAETES COMMUNITY

The sediment type is that of fine sand (26-84%) with a significant proportion very fine sand (1-68%).

The faunal component consists of the bivalve *Donax vittatus* and polychaetes *Spiophanes bombyx*, *Magelona mirabilis*, *Nephtys assimilis* and *Sigalion mathildae*. Other distinguishing species include the bivalve *Fabulina fabula*, the polychaetes *Nephtys cirrosa* and *Spio decorata*, the amphipods *Bathyporeia pelagica* and *Pontocrates arenarius* and the hermit crab *Diogenes pugilator*.

| Distinguishing species of the Fine sand with *Donax vittatus* and polychaetes community | |
|---|---|
| *Donax vittatus* | *Bathyporeia pelagica* |
| *Spiophanes bombyx* | *Diogenes pugilator* |
| *Magelona mirabilis* | *Nephtys cirrosa* |
| *Nephtys assimilis* | *Spio decorata* |
| *Fabulina fabula* | *Pontocrates arenarius* |
| *Sigalion mathildae* | |

**Table 4** Distinguishing species of the Fine sand with *Donax vittatus* and polychaetes community.

# 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. The Department of the Environment, Heritage and Local Government has prepared general guidance on the completion of such assessments (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) 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:

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| **Objective** | **To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Castlemaine Harbour, 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.

| | |
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| **Target 2** | The extent of the *Zostera* dominated community is conserved, subject to natural processes. |

- *Zostera* spp. 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.
- The likely distribution of the *Zostera* –dominated community is shown in figure 3.
    - The estimated area within the habitat Mudflats and sandflats not covered by seawater at low tide is 234ha

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| **Target 3** | The following community types should be conserved in a natural condition: Intertidal muddy fine sand community complex; Fine to muddy fine sand with polychaetes community complex; Intertidal sand with *Nephtys cirrosa*. |

- 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 Mudflats and sandflats not covered by seawater at low tide habitat given below are based on spatial interpolation and therefore should be used with a degree of caution:
      -Intertidal muddy fine sand community complex- 554ha
      -Fine to muddy fine sand with polychaetes community complex- 2637ha
      -Intertidal sand with *Nephtys cirrosa*- 861ha of which 375 ha does not occur in the Annex I habitat Estuary.
- 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 Estuaries in Castlemaine Harbour, 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 other Annex I habitats such as mudflats and sandflats not covered by seawater at low tide and a number of saltmarsh types. In such areas, the specific targets for those Annex I habitats will address requirements within the Annex I habitat Estuaries.
- 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** | The extent of the *Zostera* dominated community is conserved, subject to natural processes. |

- *Zostera* spp. 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.
- The likely distribution of the *Zostera* -dominated community is shown in figure 3.
    - The estimated area within the Estuaries habitat is 234ha

| | |
|---|---|
| **Target 3** | The following community types should be conserved in a natural condition: Intertidal muddy fine sand community complex; Fine to muddy fine sand with polychaetes community complex; Intertidal sand with *Nephtys cirrosa*; Mixed sediment 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 Estuaries habitat given below are based on spatial interpolation and therefore should be used with a degree of caution:

      -Intertidal muddy fine sand community complex- 554ha

      -Fine to muddy fine sand with polychaetes community complex- 3555ha of which 918ha does not overlap with the Annex I habitat Mudflat and sandflat not covered by sea water at low tide

      -Intertidal sand with *Nephtys cirrosa*- 486ha

      -Mixed sediment community complex- 588ha
- 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.

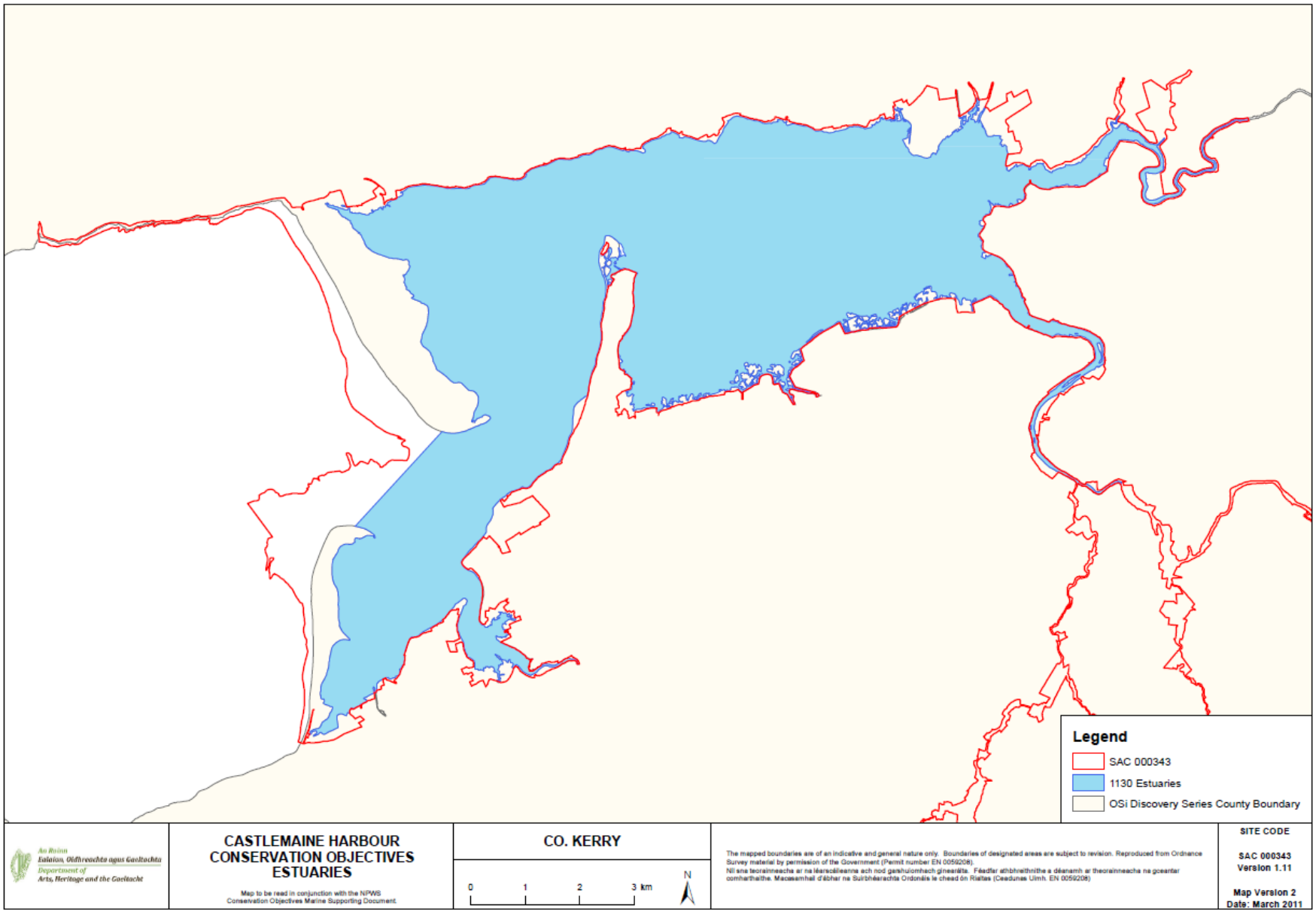


Figure 1 Extent of Annex I habitat Estuaries in Castlemaine Harbour SAC

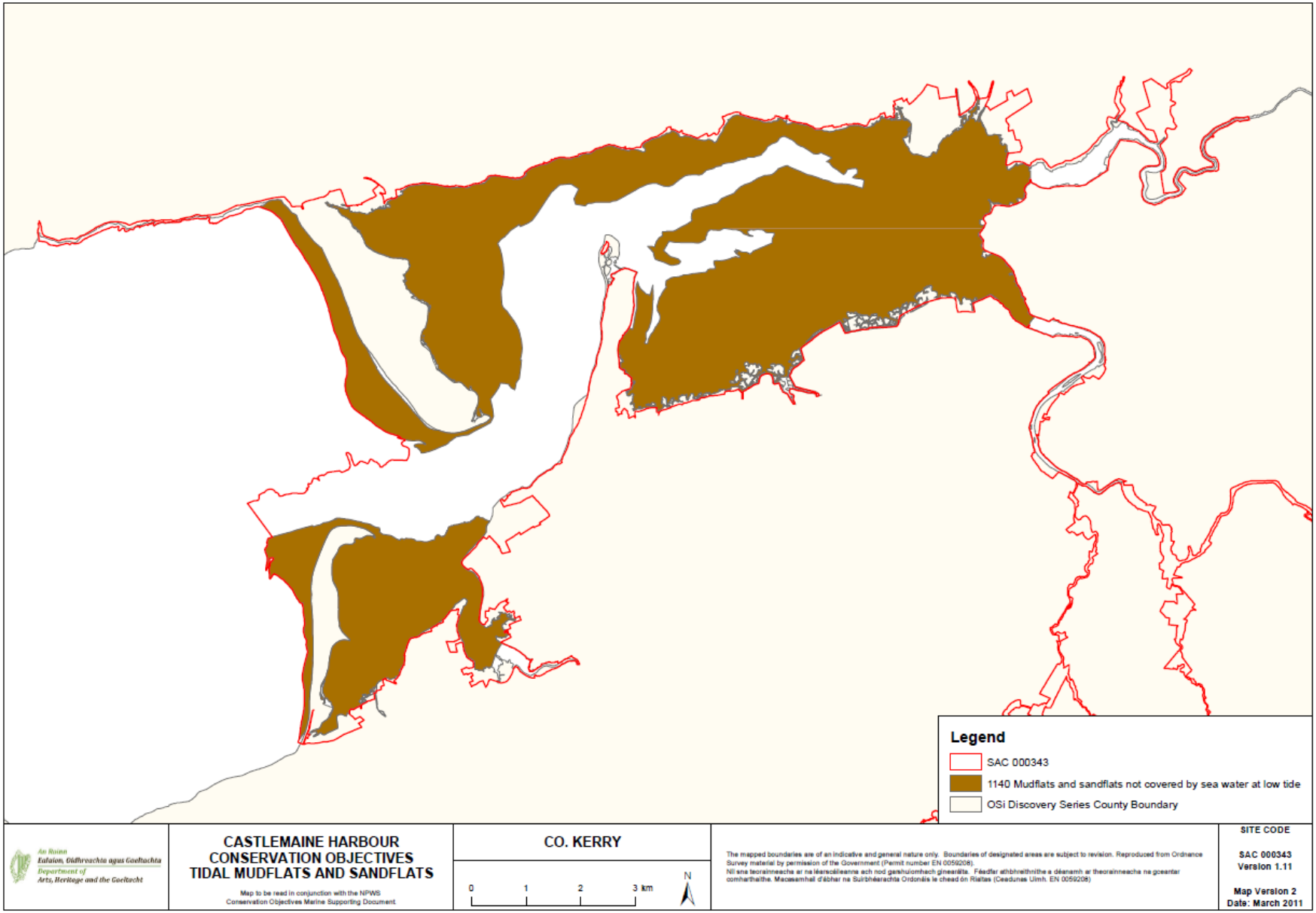


Figure 2 Extent of Annex I habitat Mudflat and sandflat not covered by seawater at low tide in Castlemaine Harbour SAC

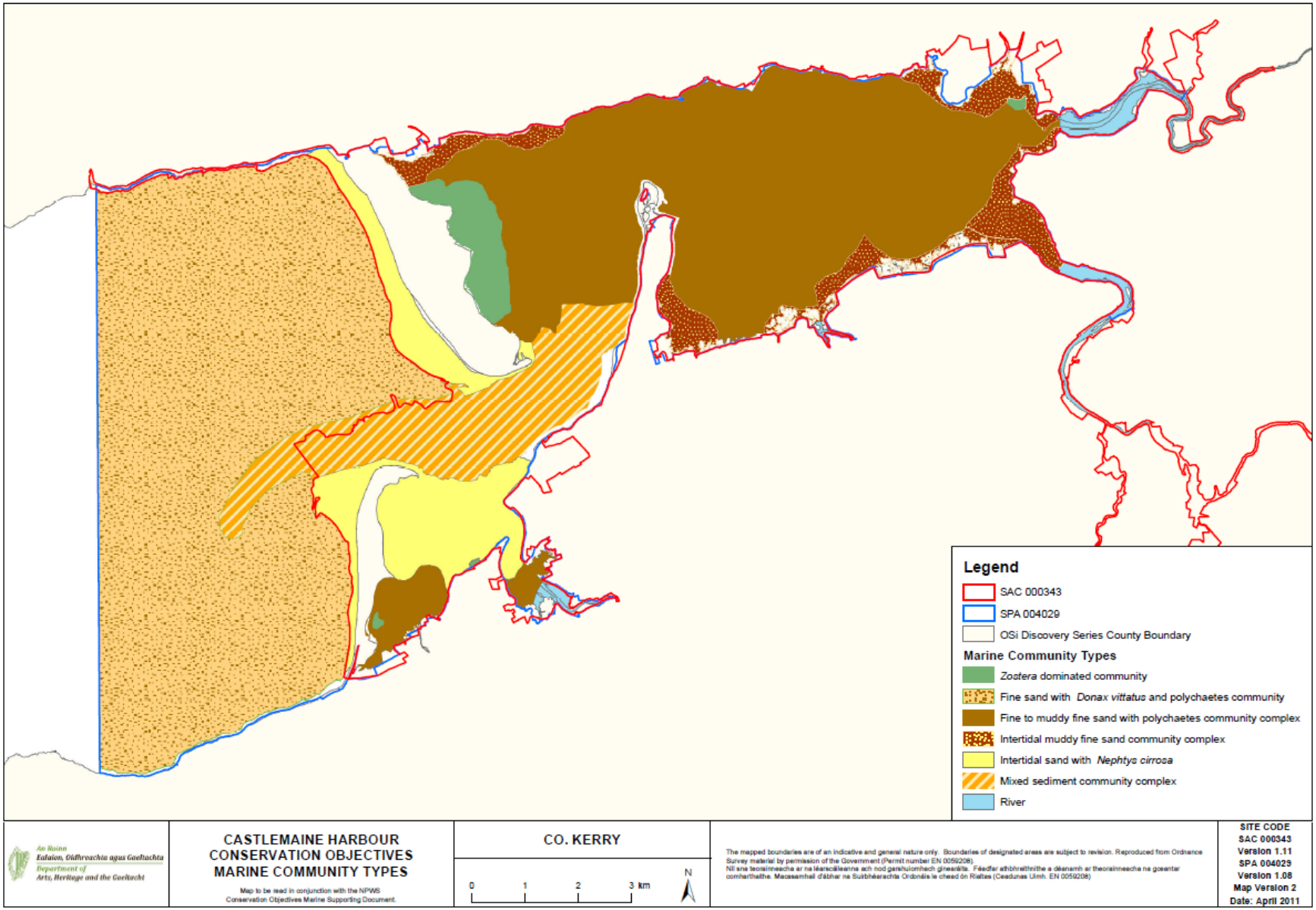


Figure 3 Broadscale community distribution in Castlemaine Harbour SAC and adjacent areas