NPWS (2012)

# Killala Bay/Moy Estuary SAC (site code: 458)

## Conservation objectives supporting document - marine habitats and species

Version 1

June 2012

## Introduction

Killala Bay/Moy Estuary SAC is designated for the marine Annex I qualifying interests of Estuaries and Mudflats and sandflats not covered by seawater at low tide (Figures 1 and 2) and the Annex II species *Phoca vitulina* (harbour seal, also known as common seal). 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.

Intertidal and subtidal surveys of Killala Bay/Moy Estuary SAC were carried out in 2010 (Aquafact, 2011; ASU, 2011). Data on the *Zostera* beds were derived from the EPA national Water Framework Directive monitoring programme (http://www.epa.ie/whatwedo/wfd/monitoring/). These data were used to investigate the physical and biological structure of the SAC and the larger overlapping Killala Bay/Moy Estuary Special Protection Area (SPA) (site code 4036).

In addition to the records compiled from historical Wildlife Service site visits and regional surveys (Summers *et al.*, 1980; Harrington, 1990; Lyons, 2004), a comprehensive survey of the Irish harbour seal population was carried out in 2003 (Cronin *et al.*, 2004). Annual monitoring surveys for harbour seal within Killala Bay/Moy Estuary SAC have also been carried out since 2009 (NPWS, 2010; NPWS, 2011; NPWS, 2012).

Aspects of the biology and ecology of Annex I habitats and Annex II species 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 Killala Bay/Moy Estuary SAC four community types are recorded. The Annex I habitats in which they occur and their presence in the overlapping SPA is presented in Table 1 and a description of each community type is given below.

| Community Type | SAC Annex I Habitats | | SPA |
|---|---|---|---|
| | Estuaries (1130) | Mudflats and sandflats not covered by seawater at low tide (1140) | |
| Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex | ✓ | ✓ | ✓ |
| *Zostera*-dominated community | ✓ | ✓ | ✓ |
| Estuarine muddy sand dominated by *Hediste diversicolor* and *Heterochaeta costata* community complex | ✓ | ✓ | ✓ |
| Fine sand dominated by *Nephtys cirrosa* community complex | ✓ | ✓ | ✓ |

**Table 1** The community types recorded in Killala Bay/Moy Estuary SAC and SPA and the Annex I habitats in which they occur.

Estimated areas of each community type per Annex I habitat are based on interpolation and 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 Killala Bay/Moy Estuary 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.

### MUDDY SAND TO FINE SAND DOMINATED BY *HYDROBIA ULVAE*, *PYGOSPIO ELEGANS* AND *TUBIFICOIDES BENEDII* COMMUNITY COMPLEX

This community complex occurs extensively in the intertidal at this site. It is recorded from the inlet at Ross in the west of the site to the Moy Estuary at its southern margins. It also occurs in the inner reaches of Rathfran Bay from Rathfranpark to the Palmerstown Bridge (Figure 3).

The sediment is that of muddy sand to fine sand with the fine sand fraction ranging from 18 to 91% and silt-clay and very fine sand range from 0.2 to 58% and 0.7 to 37%, respectively. Coarse material is generally less than 3%.

The gastropod *Hydrobia ulvae*, the polychaete *Pygospio elegans* and the oligochaete *Tubificoides benedii* occur in high to moderate abundances throughout this area, while the polychaetes *Eteone longa* and *Heteromastus filiformis* and the crustacean *Crangon crangon* occur in moderate abundances here (Table 2). The bivalve *Cerastoderma edule* is most abundant in the extensive intertidal flats between Ross and Killala in the west and in the Devlin Estuary and at Rinroe in the east. The polychaete *Arenicola marina* is generally recorded throughout the complex; it reaches its highest densities (>20$m^{-2}$) on the western part of the complex at Pollnagecler, north of Killala and east of Green Island. It is absent in the estuary south of Inishportan. The polychaete *Lanice conchilega* was recorded in densities of 80$m^{-2}$ along the lower shore at Killala Pool. *Ulva* sp. was observed sporadically at the western end of the complex at Greenpark, southwest of Geyerris Point and on the leeward side of Bartragh Island.

| **Distinguishing species of the Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex** | |
|---|---|
| *Arenicola marina* | *Eteone longa* |
| *Hydrobia ulvae* | *Cerastoderma edule* |
| *Pygospio elegans* | *Crangon crangon* |
| *Tubificoides benedii* | *Heteromastus filiformis* |
| *Lanice conchilega* | *Ulva* sp. |

**Table 2** Distinguishing species of the Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex.

#### *ZOSTERA*-DOMINATED COMMUNITY

The intertidal seagrass *Zostera noltii* is recorded at two locations within the site. The larger area is near Gortabradaun Point while the second smaller bed occurs off Kilroe (Figure 3).

The community occurs on muddy sand, with fine sand accounting for 63% of the sediment fractions and very fine sand and silt-clay account for 19% and 17%, respectively. Negligible amounts of coarse material (<1%) are recorded here.

The infauna is largely that of the Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex (Table 3).

| Species associated with the *Zostera*-dominated community | |
|---|---|
| *Zostera noltii* | *Cerastoderma edule* |
| *Arenicola marina* | *Hediste diversicolor* |
| *Hydrobia ulvae* | *Scrobicularia plana* |
| *Pygospio elegans* | *Macoma balthica* |
| *Heteromastus filiformis* | *Crangon crangon* |
| *Tubificoides benedii* | *Eteone longa* |

**Table 3** Species associated with the *Zostera*-dominated community.

### ESTUARINE MUDDY SAND DOMINATED BY *HEDISTE DIVERSICOLOR* AND *HETEROCHAETA COSTATA* COMMUNITY COMPLEX

This community complex is recorded intertidally on the eastern shore of the Moy Estuary from Rabbit Point to south of Rathmoy and on its western shore from south of Illanamuck to just south of Belleek.

The sediment here is that of muddy sand, with silt-clay and very fine sand fractions ranging from 21 to 41% and 14 to 55%, respectively. Coarse material was generally less than 7%.

This community complex is characterised by the polychaete *Hediste diversicolor* and the oligochaete *Heterochaeta costata*. The polychaete *Streblospio shrubsolii* and the crustacean *Corophium volutator* are also recorded here (Table 4).

| Distinguishing species of the Estuarine muddy sand dominated by *Hediste diversicolor* and *Heterochaeta costata* community complex | |
|---|---|
| *Hediste diversicolor* | *Streblospio shrubsolii* |
| *Heterochaeta costata* | *Corophium volutator* |

**Table 4** Distinguishing species of the Estuarine muddy sand dominated by *Hediste diversicolor* and *Heterochaeta costata* community complex.

A subtidal variant of this community occurs within the estuarine channel south of Castleconor in depths of between 2m and 4m. The sediment is variable and ranges from sandy mud to gravelly sand and sand. This variant is characterised by having low species numbers, with the crustacean *Corophium volutator* generally dominating the fauna. The polychaetes *Streblospio shrubsolii* and *Hediste diversicolor* and the oligochaete *Tubificoides pseudogaster* are also recorded here.

### FINE SAND DOMINATED BY *NEPHTYS CIRROSA* COMMUNITY COMPLEX

This community complex occurs extensively within this site from the intertidal to a depth of 5m (Figure 3). Intertidally it occurs throughout Killala Bay and on the lower shore in the Moy River Channel at Scurmore. It also occurs on both shores of Rathfran Bay from Ross Point to Cartoon. It is recorded in the subtidal from the northern boundary of the site in Killala Bay into the Moy Estuary as far as Castleconor.

The sediment is largely that of fine sand (ranging from 22 to 90%), with the remaining fines fraction accounting for less than 8% of the sediment composition. Negligible amounts of gravel (<2%) are recorded here.

The distinguishing species for this community complex include the crustacean *Bathyporeia pelagica*, the polychaete *Nephtys cirrosa* and the bivalve *Tellina tenuis* (Table 5). *T. tenuis* reaches its highest abundances in the subtidal while *B. pelagica* is the most dominant species intertidally; *N. cirrosa* is recorded throughout the complex. The crustacean *Urothoe brevicornis*, the polychaete *Scolelepis squamata* and the gastropod *Hydrobia ulvae* are also recorded from the intertidal (Table 5).

| Distinguishing species of the Fine sand dominated by *Nephtys cirrosa* community complex | |
|---|---|
| *Nephtys cirrosa* | *Urothoe brevicornis* |
| *Bathyporeia pelagica* | *Scolelepis squamata* |
| *Tellina tenuis* | *Hydrobia ulvae* |

**Table 5** Distinguishing species of the Fine sand dominated by *Nephtys cirrosa* community complex.

# Annex II Marine mammals

*PHOCA VITULINA* (HARBOUR SEAL)

This marine mammal species occurs in estuarine, coastal and offshore waters but also utilises a range of intertidal and terrestrial habitats for important life history functions such as breeding, moulting, resting and social activity. Its aquatic range for foraging and inter-site movement extends into continental shelf waters. When hauling out ashore harbour seals tend to prefer comparatively sheltered locations where exposure to wind, wave action and precipitation, for example, are minimised. Thus in Ireland the species is more commonly found ashore in sheltered bays, inlets and enclosed estuaries.

Harbour seals in Killala Bay/Moy Estuary SAC occupy both aquatic habitats and intertidal shorelines that become exposed during the tidal cycle. The species is present at the site throughout the year during all aspects of its annual life cycle which includes breeding (May to July approx.), moulting (August to September approx.) and non-breeding foraging and resting phases. Comparatively limited information is available at this site from the last period of the annual cycle spanning the months of October to May. In acknowledging the limited understanding of aquatic habitat use by the species within the site it should be noted that all suitable aquatic habitat is considered relevant to the species range and ecological requirements at the site and is therefore of potential use by harbour seals.

Harbour seals are vulnerable to disturbance during periods in which time is spent ashore or in shallow waters by individuals or groups of animals. This occurs immediately prior to and during the annual breeding season which takes place predominantly during the months of May to July. Pups are born on land, usually on sheltered shorelines, islets or skerries and uninhabited islands removed from the risk of predation and human interference. While there may be outliers in any year, specific established locations tend to be used annually for breeding-associated behaviour by adult males, adult females and their newborn pups. Such habitats are critical to the maintenance of the species within any site. Pups are able to swim soon after birth and may be observed accompanying their mother close to shore in the early days or weeks of life. They are nursed for a period of several weeks by the mother prior to weaning and abandonment. During this period adult females mate with adult males, an activity that takes place in the water. Current information on locations selected by harbour seals in Killala Bay/Moy Estuary SAC during the breeding season is comparatively limited. Known and suitable habitats for the species in the SAC during the breeding season are indicated in figure 4. Current breeding sites are broadly within the following areas: in the lower Moy estuary between Bartragh Island (south) and the mainland at Moyne/Barnasock Point, and on sandbanks to the south of Bartragh Island and west of Dooneen-Scurmore along the principal channels of the lower Moy estuary.

The necessity for individual seals to undergo an annual moult (i.e. hair shedding and replacement), which generally results in seals spending more time ashore during a relatively discrete season, provides an opportunity to record the minimum number of harbour seals occurring in a given area (i.e. minimum population estimate). Moulting is considered an intensive, energetically-demanding process which incurs further vulnerability for individuals during this period. Terrestrial or intertidal locations where seals can be found ashore are known as haul-out sites. The harbour seal moult season takes place predominantly during the months of August-September. A total of 108 harbour seals were recorded ashore within Killala Bay/ Moy

Estuary SAC in August 2003 during a national aerial survey for the species. Suitable habitat for the species along with known moult haul-out locations in Killala Bay/Moy Estuary SAC are indicated in figure 5, broadly consisting of sandbanks to the south and southeast of Bartragh Island and west of Dooneen-Scurmore along the principal channels of the lower Moy estuary.

Harbour seal is a successful aquatic predator that feeds on a wide variety of fish, cephalopod and crustacean species. For individual harbour seals of all ages, intervals between foraging trips in coastal or offshore waters are spent resting ashore at terrestrial or intertidal haul-out sites, or in the water. Outside the breeding and moulting seasons (i.e. from October-April) the location and composition of haul-out groups and individual seals may be different to those normally observed during breeding or moulting. Current information on resting locations selected by harbour seals in Killala Bay/Moy Estuary SAC outside the breeding and moulting seasons is comparatively limited. Known and suitable habitats for resting by the species are indicated in figure 6. Current sites described in Killala Bay/Moy Estuary SAC are broadly within the following areas: to the south of Bartragh Island, Goose Island and west of Dooneen-Scurmore along the principal channels of the lower Moy estuary.

# 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 and Annex II species to facilitate the appropriate assessment process:

**Objective** **To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Killala Bay/Moy Estuary 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** | 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 3. The area given below is based on spatial interpolation and therefore should be considered indicative:

  - *Zostera*-dominated community complex – 24ha

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

- It is important to ensure the quality as well as the extent of *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.
- Whilst no site-specific data has been collected to date, any significant anthropogenic disturbance to the quality of this community should be avoided.

| | |
|---|---|
| **Target 4** | Conserve the following community types in a natural condition: Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex; Estuarine muddy sand dominated by *Hediste diversicolor* and *Heterochaeta costata* community complex and Fine sand dominated by *Nephtys cirrosa* 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 Mudflats and sandflats not covered by seawater at low tide habitat given below are based on spatial interpolation and therefore should be considered indicative:
    - Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex – 909ha
    - Estuarine muddy sand dominated by *Hediste diversicolor* and *Heterochaeta costata* community complex – 54ha
    - Fine sand dominated by *Nephtys cirrosa* community complex – 346ha
- 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 Estuaries in the Killala Bay/Moy Estuary 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 | 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 3. The area given below is based on spatial interpolation and therefore should be considered indicative:
  - *Zostera*-dominated community complex – 23ha

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

- It is important to ensure the quality as well as the extent of *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.
- Whilst no site-specific data has been collected to date, any significant anthropogenic disturbance to the quality of this community should be avoided.

| Target 4 | Conserve the following community types in a natural condition: Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex; Estuarine muddy sand dominated by *Hediste diversicolor* and *Heterochaeta costata* community complex and Fine sand dominated by *Nephtys cirrosa* community complex. |
|---|---|

- A semi-quantitative description of this community has been provided in Section 1.
- An interpolation of its likely distribution is provided in figure 3.
- The estimated area of this community within the Estuaries habitat given below is based on spatial interpolation and therefore should be considered indicative:
  - Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex – 418ha
  - Estuarine muddy sand dominated by *Hediste diversicolor* and *Heterochaeta costata* community complex – 104ha
  - Fine sand dominated by *Nephtys cirrosa* community complex- 179ha
- Significant continuous or ongoing disturbance of this community should not exceed an approximate area of 15% of the interpolated area, 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 harbour seal in Killala Bay/Moy Estuary SAC, which is defined by the following list of attributes and targets**

| | |
|---|---|
| **Target 1** | Species range within the site should not be restricted by artificial barriers to site use. |

- This target may be considered relevant to proposed activities or operations that will result in the permanent exclusion of harbour seal from part of its range within the site, or will permanently prevent access for the species to suitable habitat therein.
- It does not refer to short-term or temporary restriction of access or range.
- Early consultation or scoping with the Department in advance of formal application is advisable for proposals that are likely to result in permanent exclusion.

| | |
|---|---|
| **Target 2** | Conserve the breeding sites in a natural condition. |

- This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) breeding behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual breeding season.
- Operations or activities that cause displacement of individuals from a breeding site or alteration of natural breeding behaviour, and that may result in higher mortality or reduced reproductive success, would be regarded as significant and should therefore be avoided.

| | |
|---|---|
| **Target 3** | Conserve the moult haul-out sites in a natural condition. |

- This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) moulting behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used during the annual moult.
- Operations or activities that cause displacement of individuals from a moult haul-out site or alteration of natural moulting behaviour to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.

| | |
|---|---|
| **Target 4** | Conserve the resting haul-out sites in a natural condition. |

- This target is relevant to proposed activities or operations that will result in significant interference with or disturbance of (a) resting behaviour by harbour seal within the site and/or (b) aquatic/terrestrial/intertidal habitat used for resting.
- Operations or activities that cause displacement of individuals from a resting haul-out site to an extent that may ultimately interfere with key ecological functions would be regarded as significant and should therefore be avoided.

| | |
|---|---|
| **Target 5** | Human activities should occur at levels that do not adversely affect the harbour seal at the site. |

- Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the population of harbour seal within the site. This refers to both the aquatic and terrestrial/intertidal habitats used by the species in addition to important natural behaviours during the species annual cycle.

- This target also relates to proposed activities or operations that may result in the deterioration of key resources (e.g. water quality, feeding, etc) upon which harbour seals depend. In the absence of complete knowledge on the species ecological requirements in this site such considerations should be assessed where appropriate on a case-by-case basis.
- Proposed activities or operations should not cause death or injury to individuals to an extent that may ultimately affect the harbour seal population at the site.

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Figure 1. Extent of Mudflats and sandflats not covered by seawater at low tide in Killala Bay/Moy Estuary SAC

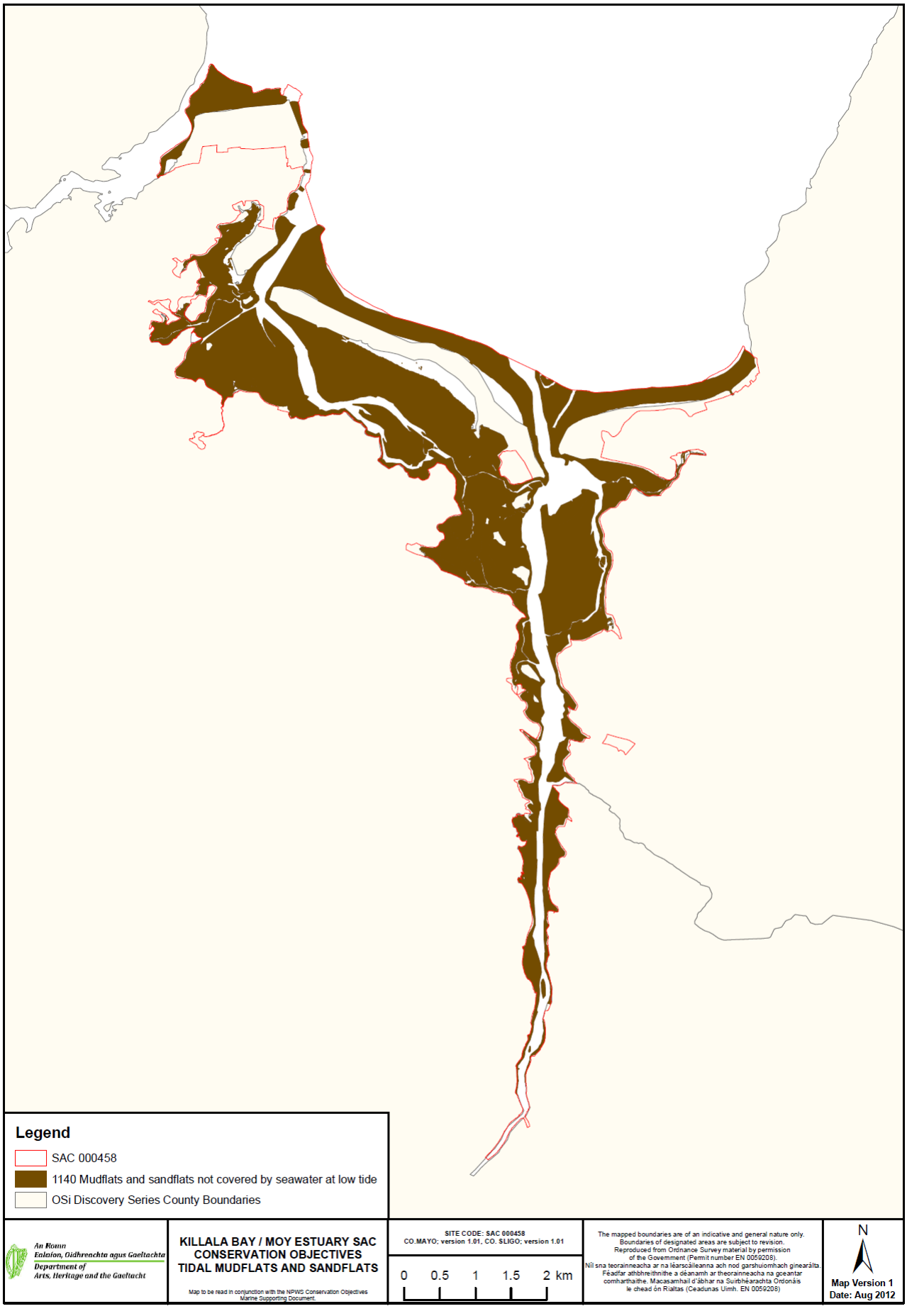

Figure 2. Extent of Estuaries in Killala Bay/Moy Estuary SAC

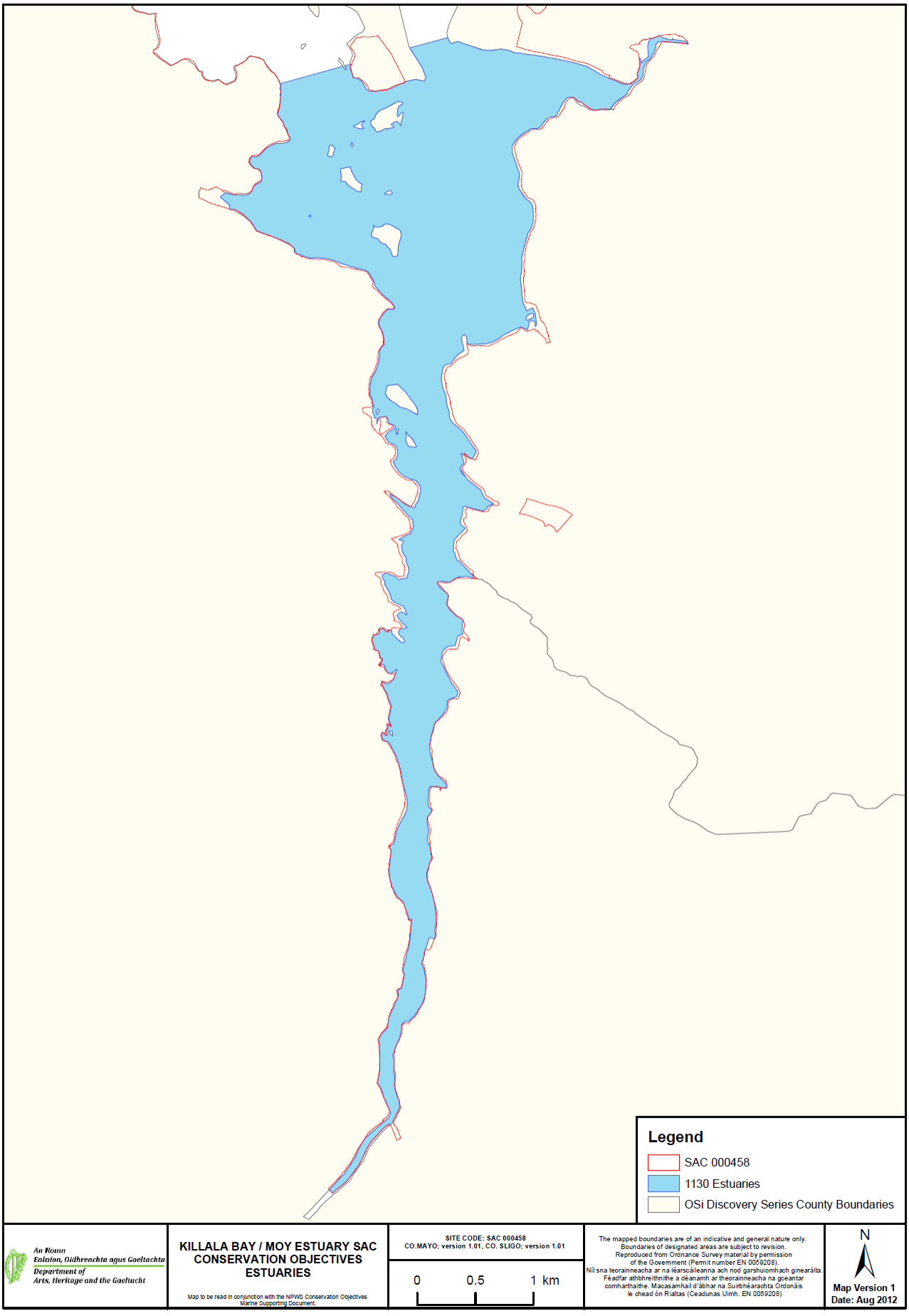

Figure 3. Distribution of sediment communities in Killala Bay/Moy Estuary SAC

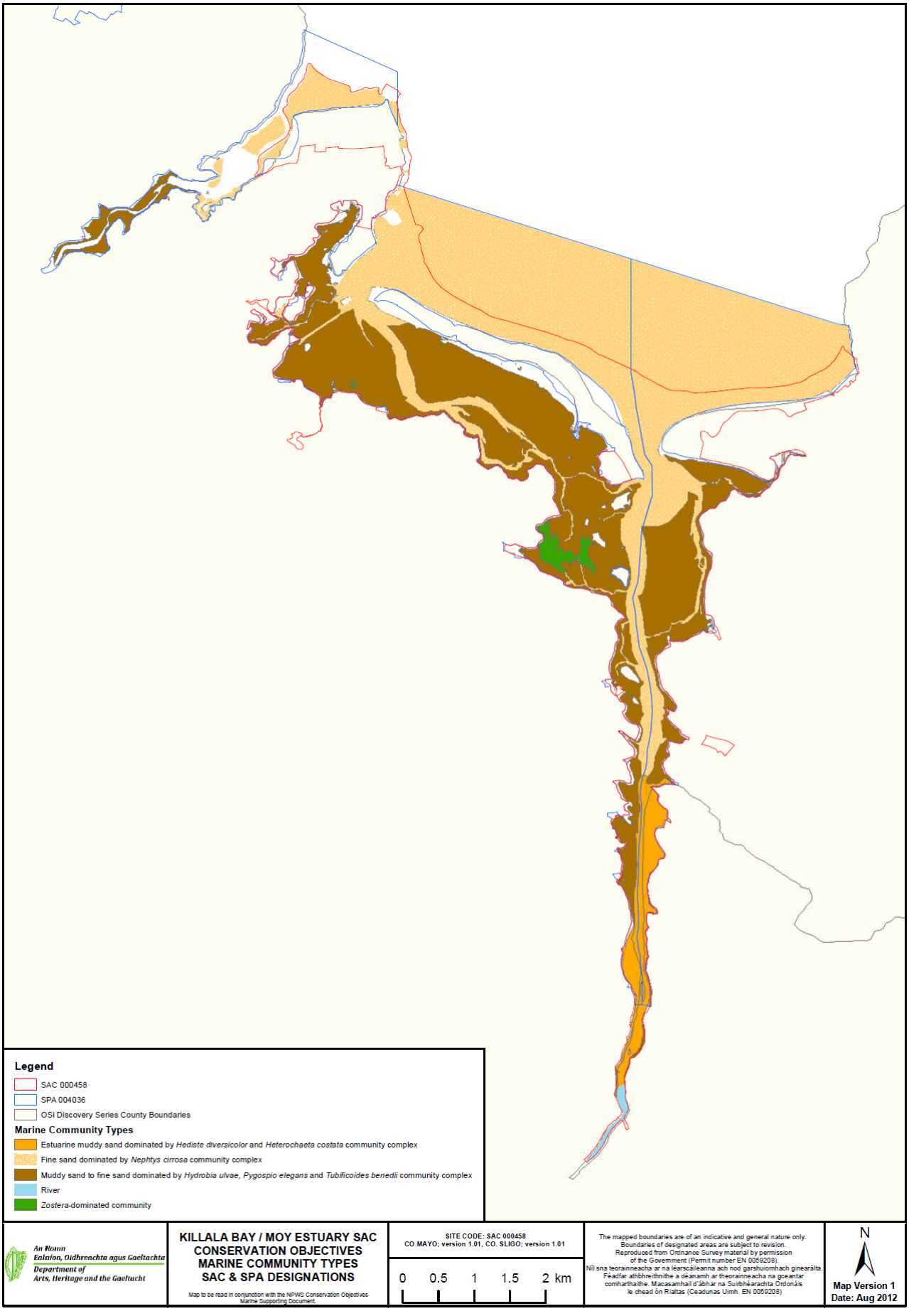

Figure 4. *Phoca vitulina* - Known breeding sites in Killala Bay/Moy Estuary SAC

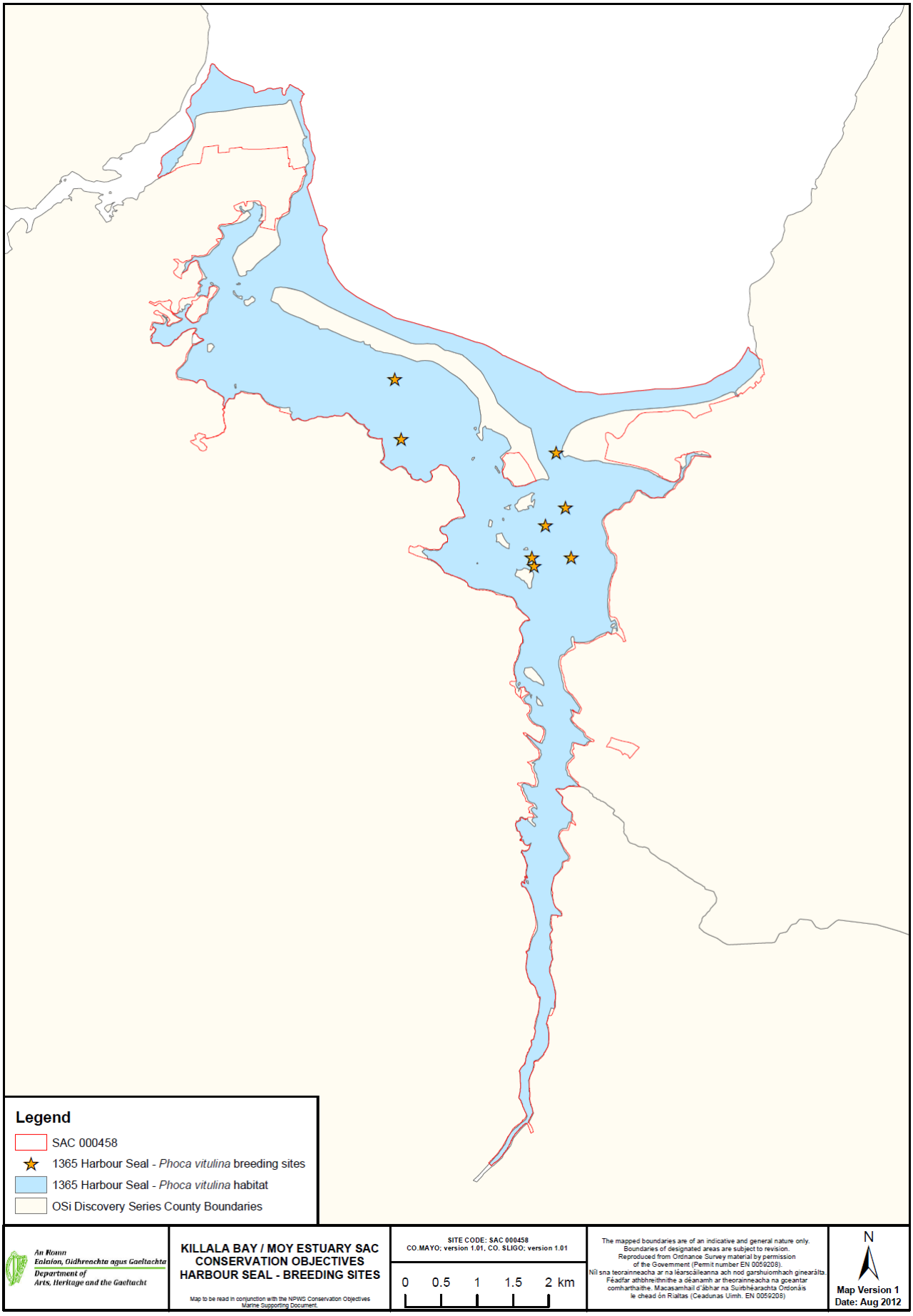

Figure 5. *Phoca vitulina* - Known moult haul out sites in Killala Bay/Moy Estuary SAC

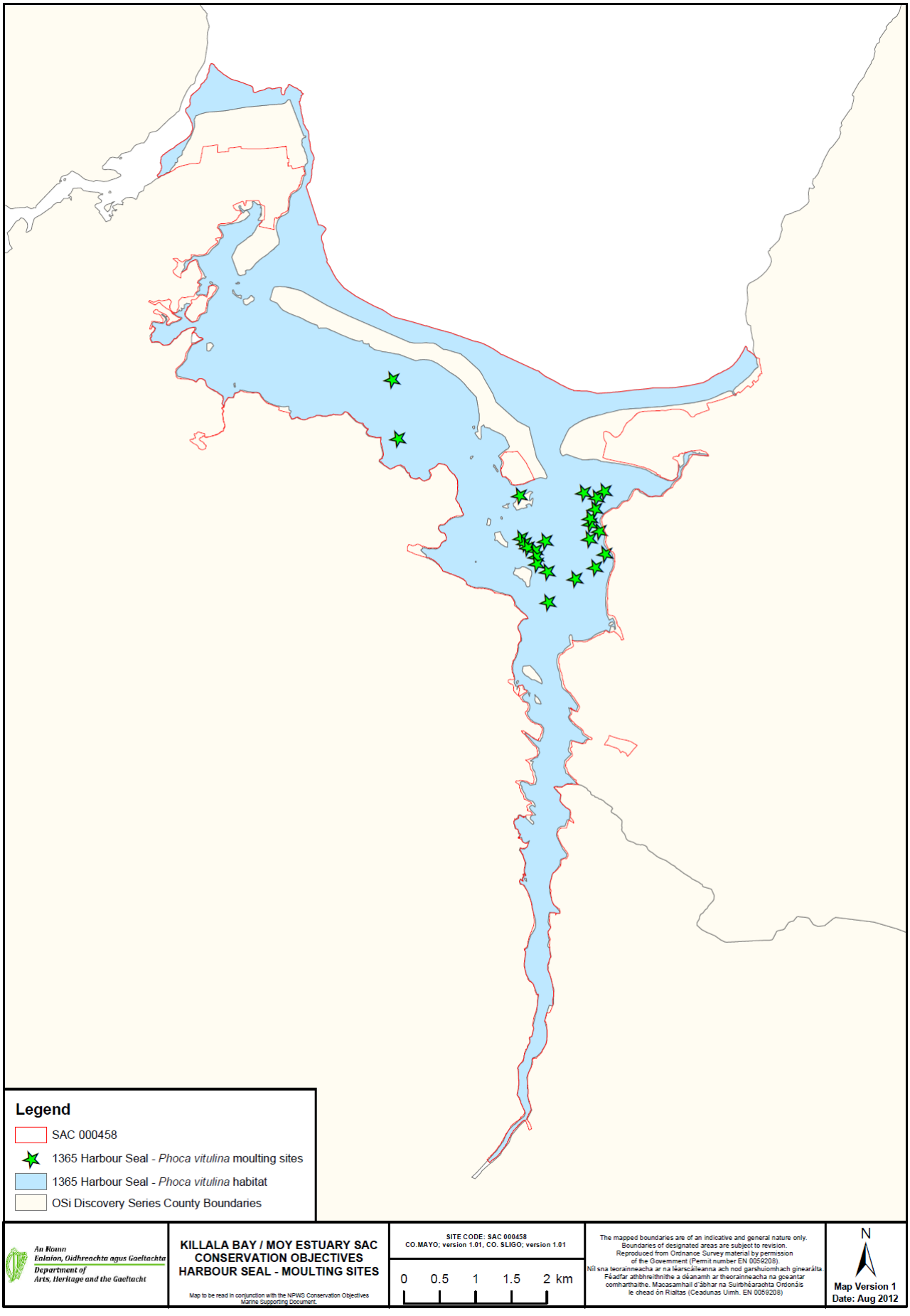

Figure 6. *Phoca vitulina* - Known resting haul-out sites (non-breeding) in Killala Bay/Moy Estuary SAC