33. Offshore Circalittoral Coarse Sediments

Background

Offshore (deep) circalittoral habitats with coarse sands and gravel or shell occur between depths of 20m to 200m. Such habitats are quite diverse compared to shallower versions of this habitat and generally characterised by robust infaunal polychaete and bivalve species. Animal communities in this habitat are closely related to offshore mixed sediments and in some areas settlement of *Modiolus modiolus* larvae may occur and consequently these habitats may occasionally have large numbers of juvenile *M. modiolus*. In areas where the mussels reach maturity their byssus threads bind the sediment together, increasing stability and allowing an increased deposition of silt (JNCC, 2022).

Table 1. Offshore Circalittoral Coarse Sediments characterising species defined by Tillin & Tyler-Walters (2013).

	Characterising species
Group 2	**Temporary or permanently attached surface dwelling or shallowly buried larger bivalves**
	Limatula subauriculata
Group 4	**Infaunal very small to medium sized suspensions and/or deposit feeding bivalves**
	Moerella pygmaea
	Thyasira flexuosa
Group 5	**Small-medium suspension and/or deposit feefing polychaetes**
	Amythasides macroglossus
Group 6	**Predatory polychaetes**
	Glycera lapidum
	Hesionura elongate
	Protodorvillea kefersteini

*Within each group species (shown in bold) with a good evidence base were selected for specific sensitivity assessment to ensure that the range of biological traits or habitat preferences expressed by species within that ecological group were represented.

Rationale for spatial protection in the Irish Sea

Offshore Circalittoral Coarse Sediment habitats were included in the features list as it is an MSFD priority habitat and is a broadly distributed feature of ecological importance within the Irish Sea. This habitat hosts a wide range of species, contributing to the biodiversity of Irish waters. These broadscale habitats do not have existing protection or management but Ireland has a legal obligation under MSFD to protect them and they are amenable to spatial protection.

Sensitivity Assessment

*Sensitivity scores and the ecological groups associated were similar among MSFD habitats.

Offshore circalittoral coarse sediments are highly sensitive to pressures associated with the construction of offshore wind farms (high confidence). Loss of the physical habitat will result in a loss of biodiversity and lead to changes in the community structure associated with this biotope (high confidence). This biotope has a moderate sensitivity to the operation of ORE (medium confidence). Ecological groups 2, 4, 5 and 6 scored a medium sensitivity to habitat structure change (low confidence). The process of extraction is considered to remove all members of these ecological groups as they are either shallowly buried, sessile or slow moving. Recovery will be mediated by the scale of the disturbance and the suitability of the sedimentary habitat remaining. Ecological groups 2 and 4, which include suspension feeders, are moderately sensitive to a change in suspended solids (medium confidence). The change is chronic and sustained for a year and is predicted to have negative impacts on growth and fecundity by reducing filter feeding efficiency and imposing costs on clearing and producing pseudofaeces for the filter feeders. These ecological groups are also moderately sensitive to heavy smothering and siltation changes (low confidence) The ecological groups are on the seabed or shallowly buried and would be buried with heavy siltation changes. The intensity and duration of siltation will be mediated by site-specific hydrodynamic conditions, such as water- flow and wave action. Based on the laboratory studies by Last *et al* (2011) and Szostek *et al* 2013, species in ecological group 2 were considered to be unable to vertically migrate through a layer of overburden at the pressure benchmark level, that is, 30cm of fine material and therefore has been assessed as highly sensitive (Tillin & Tyler-Walters, 2014).

Offshore circalittoral coarse sediments are moderately sensitive to pressures associated with the fishing sector (medium confidence). Ecological groups 2, 4 and 5 have a medium sensitivity to abrasion or the surface and penetration of the subsurface (medium confidence). Species of group 4 and 5 are infauna found close to the sediment surface. This life habit provides some protection from abrasion at the surface only, however it was considered that surface abrasion may damage and kill a proportion of the population. Members of these ecological groups will also be directly impacted by penetration and disturbance of the substratum below the surface. As mentioned previously, this biotope is also moderately sensitive to a change in suspended solids (medium confidence) (Tillin & Tyler-Walters, 2014).

Pressures associated with the shipping sector were not assessed for offshore circalittoral coarse sediments due to a lack of evidence. These include chemical pressures (Transition elements & organo-metal contamination, Hydrocarbon & PAH contamination, Synthetic compound contamination, introduction of other substances) biological pressures (introduction or spread of invasive non-indigenous species) and physical pressures (underwater noise). Further research is needed on the sensitivity of this biotope to these pressures and the shipping sector.

Further research needs

As with the other MSFD broadscale habitats, a better evidence base is needed as to the actual suite of species, particularly characterising species present in the habitats in the western Irish Sea. In addition, a number of the pressures in the analyses for the broadscale habitats are scored based on the sensitivity of a small number of characterising species due to a lack of evidence for others. There were no characterising species with sensitivity analyses already carried out for this offshore circalittoral coarse sediments. Therefore, multiple pressures are not assessed for this biotope. Further research is needed to assess the sensitivity of the full list of characterising species present to provide a more comprehensive analysis for each biotope.

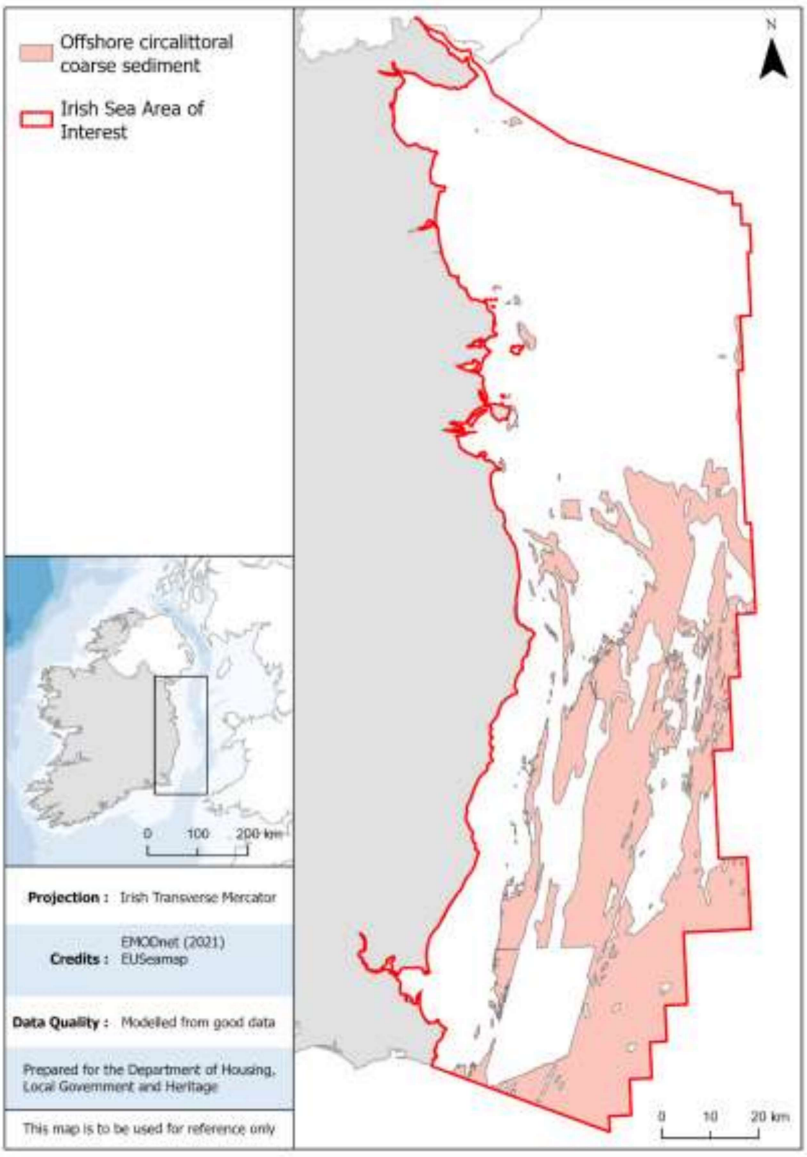

Figure 1. Data available for offshore circalittoral coarse sediments in the western Irish Sea.

Data sources and quality

Dataset Name	Data Owning Organisation	Dataset Quality	Metadata URL	Comments
EUSeaMap EMODnet Benthic Broadscale Habitat Types	EMODnet	Modelled from good data	EUSeamap (2021)	

Information on the sensitivity assessment above has been sourced from:

Tillin, H.M. & Tyler-Walters, H. (2014). Assessing the sensitivity of subtidal sedimentary habitats to pressures associated with marine activities: Phase 2 Report – Literature review and sensitivity assessments for ecological groups for circalittoral and offshore Level 5 biotopes**.** JNCC Report 512B

References

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Tillin, H.M. & Tyler-Walters, H. (2014). Assessing the sensitivity of subtidal sedimentary habitats to pressures associated with marine activities: Phase 2 Report – Literature review and sensitivity assessments for ecological groups for circalittoral and offshore Level 5 biotopes**.** JNCC Report 512B