34. Offshore Circalittoral Mixed Sediments

Background

Offshore (deep) circalittoral habitats with slightly muddy mixed gravelly sand and stones or shell occur at depths between 50m and 200m. This habitat may cover large areas of the offshore continental shelf although there is relatively little data available. Such habitats are often highly diverse with a high number of infaunal polychaete and bivalve species. Animal communities in this habitat are closely related to offshore gravels and coarse sands and in some areas populations of the horse mussel *Modiolus modiolus* may develop in these habitats (JNCC, 2022).

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

	Characterising species
Group 4	**Infaunal very small to medium sized suspensions and/or deposit feeding bivalves**
	Spisula elliptica
	Timoclea ovata
Group 5	**Small-medium suspension and/or deposit feefing polychaetes**
	Aonides paucibranchiata
	Caulleriella zetlandica
	Laonice bahuiensis
	Mediomastus fragilis
	Polycirrus
	Polydora caulleryi
	Scalibregma inflatum
Group 6	**Predatory polychaetes**
	Eumida sanguinea
	Glycera lapidum
	Harmothoe
	Hesionura elongata
	Lumbrineris gracilis (Lumbrineris spp)
Group 8(c)	**Free living interface suspension/deposit feeders: Ophiuroidea**
	Amphipholis squamata

*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 Mixed 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 mixed sediments are highly sensitive to pressures associated with the construction (high confidence) and operation (low confidence) of offshore wind farms. 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). Species in ecological group 5 were assessed as highly sensitive to habitat structure change and heavy smothering and siltation changes (low confidence). Extraction would remove all individuals within the extraction footprint and hence resistance is assessed as **'None'**. Resilience is predicted to be '**Low'** for *C. zetlandica and* sensitivity is therefore assessed as **'High'.** For heavy siltation changes Richardson *et al* (1977) reported that the species most affected by dredged material disposal were tube-dwelling polychaetes. Therefore, within this ecological group the tube dwelling polychaetes *Lanice conchilega*, *Ampharete falcata*, *Polydora caulleryi* and *Caulleriella zetlandica* were considered to have a resistance of **'None'.** The resilience of *C. zetlandica* is assessed as '**Low**', and sensitivity is therefore, '**High**' (Tillin & Tyler-Walters, 2014).

Offshore circalittoral mixed sediments are moderately sensitive to pressures associated with the fishing sector (medium confidence). Ecological groups 4, 5 and 8(c) have a medium sensitivity to surface abrasion and penetration of the substratum (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. Abrasion at the surface of the sediment has the potential to directly impact ecological group 8(c). Many of the species represented by this group are epifaunal and would be directly exposed to any source of abrasion and subsurface penetration. *Amphiura* species are shallow burrowers but extend arms above the surface to feed, these would be directly exposed. In some structurally complex habitats, individuals beneath stones or in crevices may avoid this pressure (Tillin & Tyler-Walters, 2014).

Pressures associated with the shipping sector were not assessed for offshore circalittoral mixed 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 mixed 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.

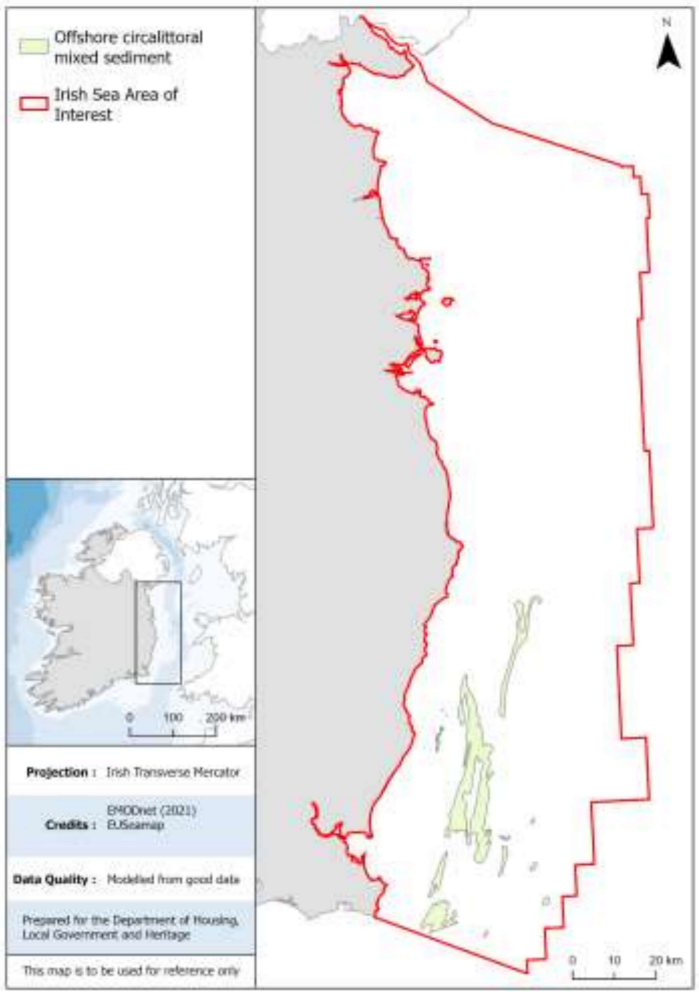

Figure 1. Data available for offshore circalittoral mixed sediments in the western Irish Sea.

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

JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. Available from: https://mhc.jncc.gov.uk/

Richardson, M.D., Carey, A.G. & Colgate, W.A. (1977). Aquatic disposal field investigations Columbia River disposal site, Oregon Appendix C: The effects of dredged material disposal on benthic assemblages. *Dredged Material Research Programme Technical Report D-77-30*. 1-411 pp.

Tillin, H, Tyler-Walters, H. (2013). Assessing the sensitivity of subtidal sedimentary habitats to pressures associated with marine activities. Phase 1 Report: Rationale and proposed ecological groupings for Level 5 biotopes against which sensitivity assessments would be best undertaken JNCC Report No. 512A.

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.