25. Circalittoral Coarse Sediments

Background

Tide-swept circalittoral coarse sands, gravel and shingle generally in depths of over 15-20m to a maximum depth of 50m. This habitat may be found in tidal channels of marine inlets, along exposed coasts and offshore. This habitat, as with shallower coarse sediments, may be characterised by robust infaunal polychaetes, mobile crustacea and bivalves. Certain species of sea cucumber (e.g. *Neopentadactyla*) may also be prevalent in these areas along with the lancelet *Branchiostoma lanceolatum* (JNCC, 2022).

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

	Characterising species	MarLIN link
Group 1(d)	**Small epifaunal species with hard or protected bodies**	
	Bryozoa indet crusts	https://www.marlin.ac.uk/species/detail/1582
	Balanus Balanus	
	Balanus crenatus	https://www.marlin.ac.uk/species/detail/1381
	Pomatoceros triqueter	
Group 2	**Temporary or permanently attached surface dwelling or shallowly buried larger bivalves**	
	Pecten maximus	https://www.marlin.ac.uk/species/detail/1398
Group 3	**Mobile predators and scavengers**	
	Pagurus bernhardus	
	Asterias rubens	https://www.marlin.ac.uk/species/detail/1194
Group 5	**Small-medium suspension and/or deposit feefing polychaetes**	
	Aonides paucibranchiata	
	Caulleriella zetlandica	
	Chaetopterus variopedatus	
	Lanice conchilega	https://www.marlin.ac.uk/species/detail/1642
	Mediomastus fragilis	
	Minuspio cirrifera	
	Owenia fusiformis	https://www.marlin.ac.uk/species/detail/1703
	Polygordius	
Group 6	**Predatory polychaetes**	

	Exogone verrugera	
	Glycera lapidum	
	Hesionura elongate	
	Lumbrineris gracilis	
	(Lumbrineris spp)	
	Pisione remota	
	Protodorvillea kefersteini	
Group 7	**Very small - small, short lived (<2 years) free-living species**	
	Ampelisca spp.	
Group 8(a)	**Subsurface dwelling Echinoids**	
	Echinocyamus pusillus	
Group 8(b)	**Surface dwelling Echinoids**	
	Echinus esculentus	https://www.marlin.ac.uk/species/detail/1311
Group 8(c)	**Free living interface suspension/deposit feeders: Ophiuroidea**	
	Ophiura albida	
Group 8(d)	**Large burrowing Holothuroidea**	
	Neopentadactyla mixta	
Group 10	**Burrowing, soft-bodied species**	
	Branchiostoma lanceolatum	

*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

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.

Circalittoral coarse sediments are highly sensitive to pressures associated with the construction and operation of offshore renewable infrastructure (medium confidence). Loss or change of the physical habitat could lead to a loss of biodiversity and lead to changes in the community structure associated with this biotope (low confidence). *Neopentadactyla mixta* is only characteristic of coarse gravel and maerl and only found in coarse gravel/maerl sediment. Therefore, a change in sediment type would result in a significant loss in abundance of this species, as well as major changes in the associated community (Tillin & Tyler-Walters, 2014).

Circalittoral coarse sediments are highly sensitive to pressures associated with the four fishing sub sectors (medium confidence). As with ORE a physical change to the seabed or sediment type can occur with surface and subsurface fishing, leading to a loss of biodiversity within this biotope (low confidence). In addition, this habitat type has a high sensitivity to removal of target species (low confidence). Species within the sensitive ecological group (group 8(d)) are not targeted by commercial fisheries and hence are not directly affected by this pressure. However, maerl extraction for the coralline algae itself can result in complete destruction of maerl beds. For example, in Brittany, the clean maerl gravel of the Glenan maerl bank described in 1969, was degraded to muddy sand dominated by deposit feeders and omnivores within 30 years (Grall & Hall- Spencer 2003). Whereas Birkett *et al* (1998) noted that although maerl beds subject to extraction in the Fal estuary exhibit a diverse flora and fauna, they were less species-rich than those in Galway Bay, although direct correlation with dredging was unclear (Grall & Hall-Spencer 2003). Grall and Glemarec (1997, cited in Birkett *et al* 1998) reported few differences in biological composition between exploited and control beds in Brittany. The degree of impact therefore depends on the intensity of extraction and/or on the context (Tillin & Tyler-Walters, 2014).

Circalittoral coarse sediments are highly sensitive to shipping related pressures (medium confidence). This includes the introduction or spread of invasive non-indigenous species (medium confidence). No information on the direct effects of non-native species on the characterising species *Neopentadactyla mixta* was found. Yet *Crepidula fornicata* beds may form on sedimentary habitats. Grall and Hall-Spencer (2003) note that beds of invasive slipper limpet *Crepidula fornicata* grew across maerl beds in Brittany. As a result, the maerl thalli were killed, and the bed clogged with silt and pseudo-faeces, so that the associated community was drastically changed (Tillin & Tyler-Walters, 2014).

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. 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.

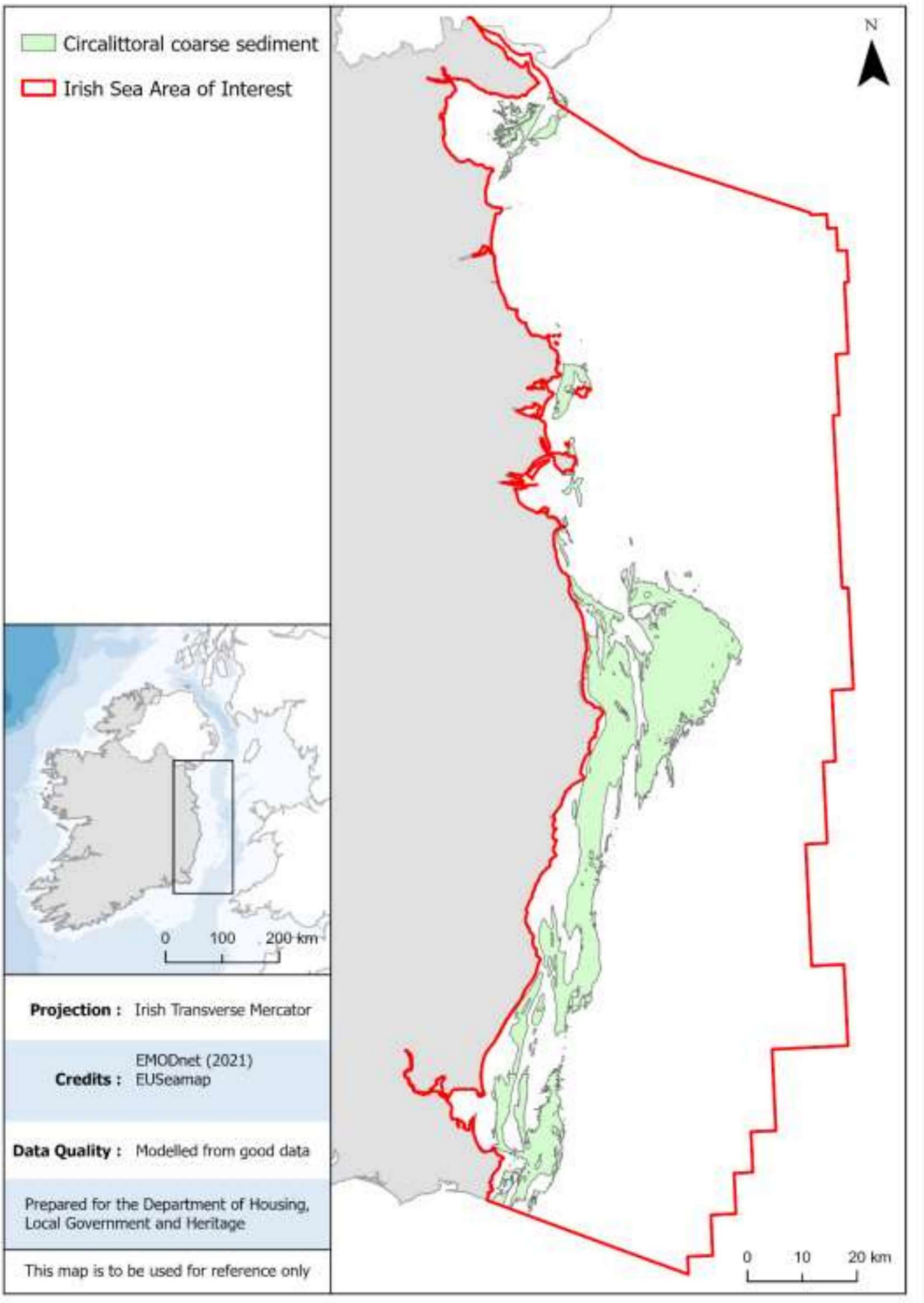

Figure 1. Data available for circalittoral coarse sediments in the western Irish Sea.

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, 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