31. Infralittoral Mud

Background

Shallow sublittoral muds, extending from the extreme lower shore to about 15-20 m depth in fully marine or near marine conditions, predominantly in extremely sheltered areas with very weak tidal currents. Such habitats are found in sea lochs and some rias and harbours. Populations of the lugworm *Arenicola marina* may be dense, with anemones, the opisthobranch *Philine aperta* and synaptid holothurians also characteristic in some areas. The extent of the oxidised layer may be shallow with some areas being periodically or permanently anoxic. In these areas bacterial mats may develop on the sediment surface. Infaunal records for this biotope complex are limited encompassing only one biotope. They are therefore not representative of the full suite of infaunal species found in this biotope (JNCC, 2022).

Table 1. Infralittoral Mud characterising species defined by Tillin & Tyler-Walters (2013).

	Characterising species	MarLIN Link
Group 1(b)	**Erect, shorter lived epifaunal species**	
	Hydractinia echinate	
Group 2	**Temporary or permanently attached surface dwelling or shallowly buried larger bivalves**	
	Cerastoderma edule	https://www.marlin.ac.uk/species/detail/1384
Group 3	**Mobile predators and scavengers**	
	Carcinus maenas	https://www.marlin.ac.uk/species/detail/1497
	Pagurus bernhardus	
	Asterias rubens	https://www.marlin.ac.uk/species/detail/1194
	Liocarcinus depurator	https://www.marlin.ac.uk/species/detail/1175
	Philine aperta	https://www.marlin.ac.uk/species/detail/1412
Group 4	**Infaunal very small to medium sized suspensions and/or deposit feeding bivalves**	
	Abra nitida	
Group 5	**Small-medium suspension and/or deposit feefing polychaetes**	
	Arenicola marina	https://www.marlin.ac.uk/species/detail/1402
	Aphelochaeta marioni	https://www.marlin.ac.uk/species/detail/155

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	Polydora ciliata	https://www.marlin.ac.uk/species/detail/1410
	Chaetozone caputesocis	
Group 6	**Predatory polychaetes**	
	Hediste diversicolor	https://www.marlin.ac.uk/species/detail/1426
Group 10	**Burrowing, soft-bodied species**	
	Cerianthus lloydii	

*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

Infralittoral Mud 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.

Infralittoral muds are highly sensitive to pressures associated with the construction of ORE (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 (high confidence). Species within ecological group 10 appear to occur in a relatively restricted range of sediment types, related to burrowing, feeding and other characteristics. The species are therefore considered to have **'Low' resistance** (loss of 25-75% of population)(low confidence) to a change in sediment type. **Resilience** is assessed as **'Medium'** (**2-10 years** following habitat recovery)(low confidence). In addition, a number of the ecological groups (1(b), 1(c), 1(d), 2, 3, 4, 5, 6, 8(a), 8(b), 8(c) & 10) consists of surface dwelling or shallowly buried species and removal of substratum would result in all individuals within the extraction footprint being removed (Tillin & Tyler-Walters, 2014).

Infralittoral muds are moderately sensitive to pressures associated with the fishing sector (high confidence). Species of ecological groups 2, 4 and 10 are 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. Sensitivity to a change in suspended solids was deemed moderately sensitive for ecological groups 2 and 4 (medium confidence). The groups are not predicted to be sensitive to acute changes in turbidity. However at the pressure benchmark the change is chronic and sustained for a year. This 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 (Rayment, 2007; Tillin & Tyler-Walters, 2014).

Infralittoral muds are moderately sensitive to pressures associated with shipping related activities (high confidence). MarLIN has carried out sensitivity analyses for a number of characterising species found in this habitat type. Many of the species were assigned a medium sensitivity to chemical pressures associated with the shipping sector (high confidence). *Asterias rubens* and *Carcinus maenas* have a medium sensitivity to hydrocarbon and PAH contamination while *Hediste diversicolor, Aphelochaeta marioni and Arenicola marina* have a medium sensitivity to synthetic compound contamination.

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.

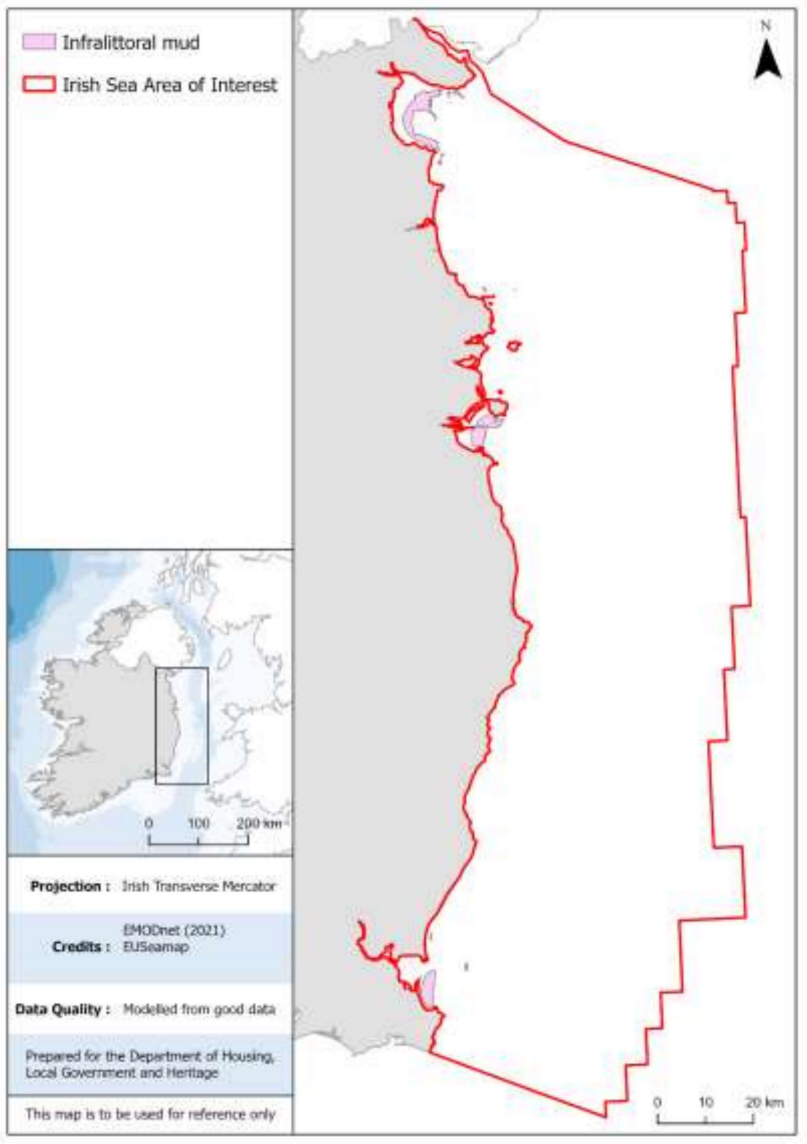

Figure 1. Data available for infralittoral mud in the western Irish Sea.

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/

Rayment, W.J. (2007). *Venerupis corrugata* Pullet carpet shell. In Tyler-Walters H. and Hiscock K. *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 25-04-2023]. Available from: https://www.marlin.ac.uk/species/detail/1558

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