30. Infralittoral Mixed Sediments

Background

Shallow mixed (heterogeneous) sediments in fully marine or near fully marine conditions, supporting various animal-dominated communities, with relatively low proportions of seaweeds. This habitat may include well mixed muddy gravelly sands or very poorly sorted mosaics of shell, cobbles and pebbles embedded in mud, sand or gravel. Due to the quite variable nature of the sediment type, a widely variable array of communities may be found, including those characterised by bivalves, polychaetes and file shells. This has resulted in many species being described as characteristic of this biotope complex all contributing only a small percentage to the overall similarity (JNCC, 2022).

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

	Characterising species	MarLIN Link
Group 1(b)	**Erect, shorter lived epifaunal species**	
	Hydrallmania falcata	
Group 1(c)	**Soft-bodied epifaunal species**	
	Styela clava	
	Alcyonium digitatum	https://www.marlin.ac.uk/species/detail/1187
	Urticina feline	https://www.marlin.ac.uk/species/detail/1392
Group 1(d)	**Small epifaunal species with hard or protected bodies**	
	Spirobranchus triqueter	
	Crepidula fornicate	
	Calyptraea chinensis	
	Calliostoma zizyphinum	
	Spirobranchus lamarcki	
Group 2	**Temporary or permanently attached surface dwelling or shallowly buried larger bivalves**	
	Limaria hians	
	Ostrea edulis	https://www.marlin.ac.uk/species/detail/1146
	Venerupis corrugate	https://www.marlin.ac.uk/species/detail/1558
Group 3	**Mobile predators and scavengers**	
	Necora puber	

	Buccinum undatum	
	Asterias rubens	https://www.marlin.ac.uk/species/detail/1194
	Paguridae	
	Pagurus bernhardus	
	Cancer pagurus	https://www.marlin.ac.uk/species/detail/1179
	Carcinus maenas	https://www.marlin.ac.uk/species/detail/1497
	Hyas Araneus	
Group 4	**Infaunal very small to medium sized suspensions and/or deposit feeding bivalves**	
	Tellimya ferruginosa	
Group 5	**Small-medium suspension and/or deposit feefing polychaetes**	
	Sphaerosyllis hystrix	
	Notomastus latericeus	
	Tubificoides swirencoides	
	Tubificoides benedii	
	Caulleriella alata	
	Sabella pavonine	
	Mediomastus fragilis	
	Aphelochaeta marioni	https://www.marlin.ac.uk/species/detail/1556
	Lanice conchilega	https://www.marlin.ac.uk/species/detail/1642
	Melinna palmata	
	Chaetozone gibber	
	Amphicteis gunneri	
Group 6	**Predatory polychaetes**	
	Syllidia armata	
	Phyllodoce mucosa	
Group 7	**Very small-small, short lived (<2 years) free-living species**	
	Monocorophium sextonae	
	Apseudopsis latreillii	
	Maera grossimana	

	Gammarella fucicola	
	Abludomelita gladiosa	
	Janira maculosa	
	Metaphoxus simplex	
Group 8(c)	**Free living interface suspension/deposit feeders: Ophiuroidea**	
	Ophiothrix fragilis	https://www.marlin.ac.uk/species/detail/1198
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 Mixed Sediments 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 mixed sediments are highly sensitive to pressures associated with the construction of offshore renewable infrastructure (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(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 mixed sediments are moderately sensitive to pressures associated with the fishing sector (high confidence). A number of the ecological groups present in this habitat were assessed as moderately sensitive to abrasion and penetration of the substratum including group 1(c): Soft-bodied epifaunal species (medium confidence). As erect epifauna, the growth form of members of this ecological group means they are exposed to direct physical damage from abrasion and sub-surface damage. Individuals may be directly displaced, damaged or removed as by-catch. Fishing may move the boulders and cobbles that these species are attached to. If these are turned over, species may die from physical damage or prevention of feeding (Tillin & Tyler-Walters, 2014). 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 mixed sediments 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, Ophiothrix fragilis and Carcinus maenas have a medium sensitivity to hydrocarbon and PAH contamination while Lanice conchilega, Urticina felina, Cancer pagurus, Aphelochaeta marioni and Venerupis corrugata 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.

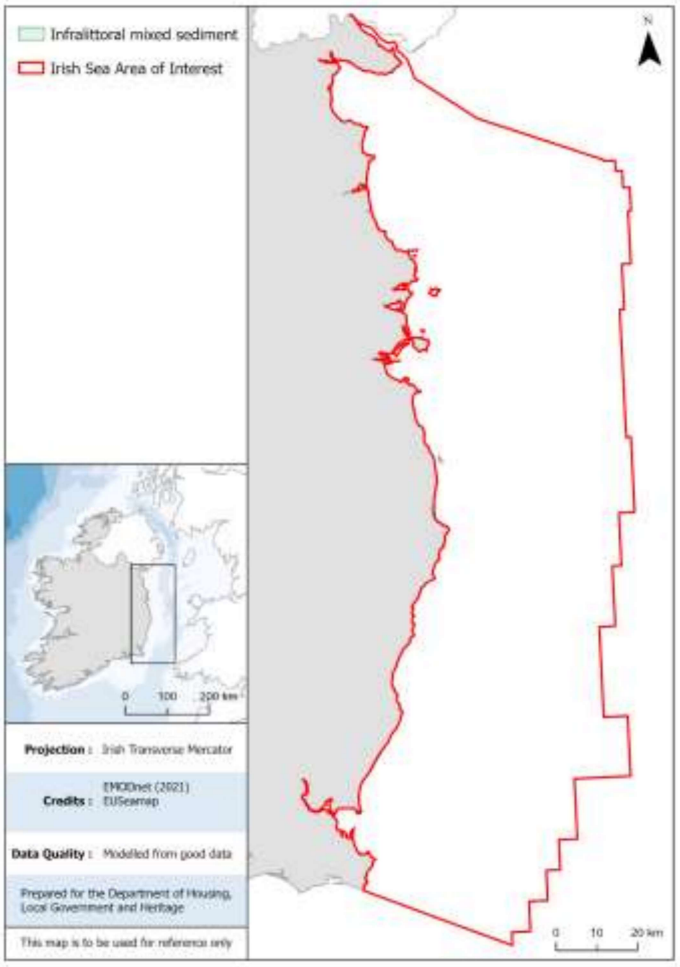

Figure 1. Data available for infralittoral mixed sediments in the western Irish Sea.

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/

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