

29. Infralittoral Coarse Sediments

Background

These habitats occur at depths between 5 and 50 metres. They are moderately exposed habitats with coarse sand, gravelly sand, shingle and gravel in the infralittoral, and are subject to disturbance by tidal streams and wave action. Such habitats found on the open coast or in tide-swept marine inlets are characterised by a robust fauna of infaunal polychaetes such as *Chaetozone setosa* and *Lanice conchilega*, cumaceans such as *Iphinoe trispinosa* and *Diastylis bradyi*, and venerid bivalves (JNCC, 2022).

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

	Characterising species	MarLIN Link
Group 2	Temporary or permanently attached surface dwelling or shallowly buried larger bivalves	
	<i>Ensis ensis</i>	https://www.marlin.ac.uk/species/detail/1419
Group 3	Mobile predators and scavengers	
	<i>Pagurus bernhardus</i>	
	<i>Asterias rubens</i>	https://www.marlin.ac.uk/species/detail/1194
	<i>Carcinus maenas</i>	https://www.marlin.ac.uk/species/detail/1497
	<i>Liocarcinus depurator</i>	https://www.marlin.ac.uk/species/detail/1175
Group 4	Infaunal very small to medium sized suspensions and/or deposit feeding bivalves	
	<i>Nucula nitidosa</i>	
	<i>Abra alba</i>	https://www.marlin.ac.uk/species/detail/1722
Group 5	Small-medium suspension and/or deposit feeding polychaetes	
	<i>Lanice conchilega</i>	https://www.marlin.ac.uk/species/detail/1642
	<i>Chaetozone setosa</i>	
	<i>Spio martinensis</i>	
	<i>Scoloplos armiger</i>	
	<i>Spiophanes bombyx</i>	https://www.marlin.ac.uk/species/detail/1705
	<i>Magelona mirabilis</i>	

	<i>Mediomastus fragilis</i>	
Group 6	Predatory polychaetes	
	<i>Glycera lapidum</i>	
	<i>Nephtys cirrose</i>	
	<i>Phyllodoce maculata</i>	
	<i>Eteone longa</i>	
	<i>Nephtys hombergii</i>	https://www.marlin.ac.uk/species/detail/1710
Group 7	Very small-small, short lived (<2 years) free-living species	
	<i>Diastylis bradyi</i>	
	<i>Iphinoe trispinosa</i>	
Group 8(a)	Subsurface dwelling Echinoids	
	<i>Echinocardium cordatum</i>	https://www.marlin.ac.uk/species/detail/1417

*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 Coarse 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 coarse 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). Pressures associated with the operation of ORE, including the physical change of the sediment type and removal of substratum, have a medium sensitivity (medium confidence). Species within ecological group 8(a) vary in environmental requirements but each appears 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** to a change in sediment type (low confidence)

but resilience is assessed as ‘**Medium**’ (recovery within 2-10 years) (medium confidence). It is also noted that this ecological group is not able to colonise artificial hard substratum and the introduction of this would reduce the extent of suitable habitat (Tillin & Tyler-Walters, 2014). In addition, a number of the ecological groups (2, 3, 4, 5, 6 & 8(a)) 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). Lastly, groups 2, 4, 5 and 8(a) are moderately sensitive to heavy smothering and siltation changes (Low confidence). As the members of these ecological groups are shallowly buried they would be buried by the deposit. Some species are considered to be unable to vertically migrate through a layer of overburden at the pressure benchmark level, that is, 30cm of fine material. For mobile species, the character of the overburden is an important factor determining the degree of vertical migration of buried bivalves. Individuals are more likely to escape from a covering similar to the sediments in which the species is found than a different type (Tillin & Tyler-Walters, 2014).

Infralittoral coarse sediments are moderately sensitive to pressures associated with the fishing sector (high confidence). Ecological groups 2 and 4 are moderately sensitive to surface abrasion (medium confidence), while groups 2, 4 and 8(a) are moderately sensitive to penetration of the substratum (medium confidence). Species of ecological group 4, for example, 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 this ecological group will also be directly impacted by penetration and disturbance of the substratum below the surface. Ecological group 8(a) represents infaunal sea urchins that are shallowly buried and the fragility of the tests means that these species have little protection from abrasion that is coupled with penetration and disturbance of the seabed. Groups 2 and 4, which include suspension feeders, are also moderately sensitive to a change in suspended solids (medium confidence). The change in suspended solids is chronic and sustained for a year and is predicted to have negative impacts on growth and fecundity by reducing filter feeding efficiency (Tillin & Tyler-Walters, 2014).

Infralittoral coarse sediments are moderately sensitive to pressures associated with shipping 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). For example, Smith (1968) found synthetic compound contamination caused mass mortalities of *Echinocardium cordatum* and *Ensis spp.* when detergents were used to disperse oil from the Torrey Canyon oil (Hill, 2006 & Hill, 2008). The same species were also found to be highly intolerant of hydrocarbons. A number of oil spills has resulted in reduced abundance of both *Echinocardium cordatum* and *Ensis spp.*, however recovery is assessed as ‘high’ resulting in a medium sensitivity.

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.

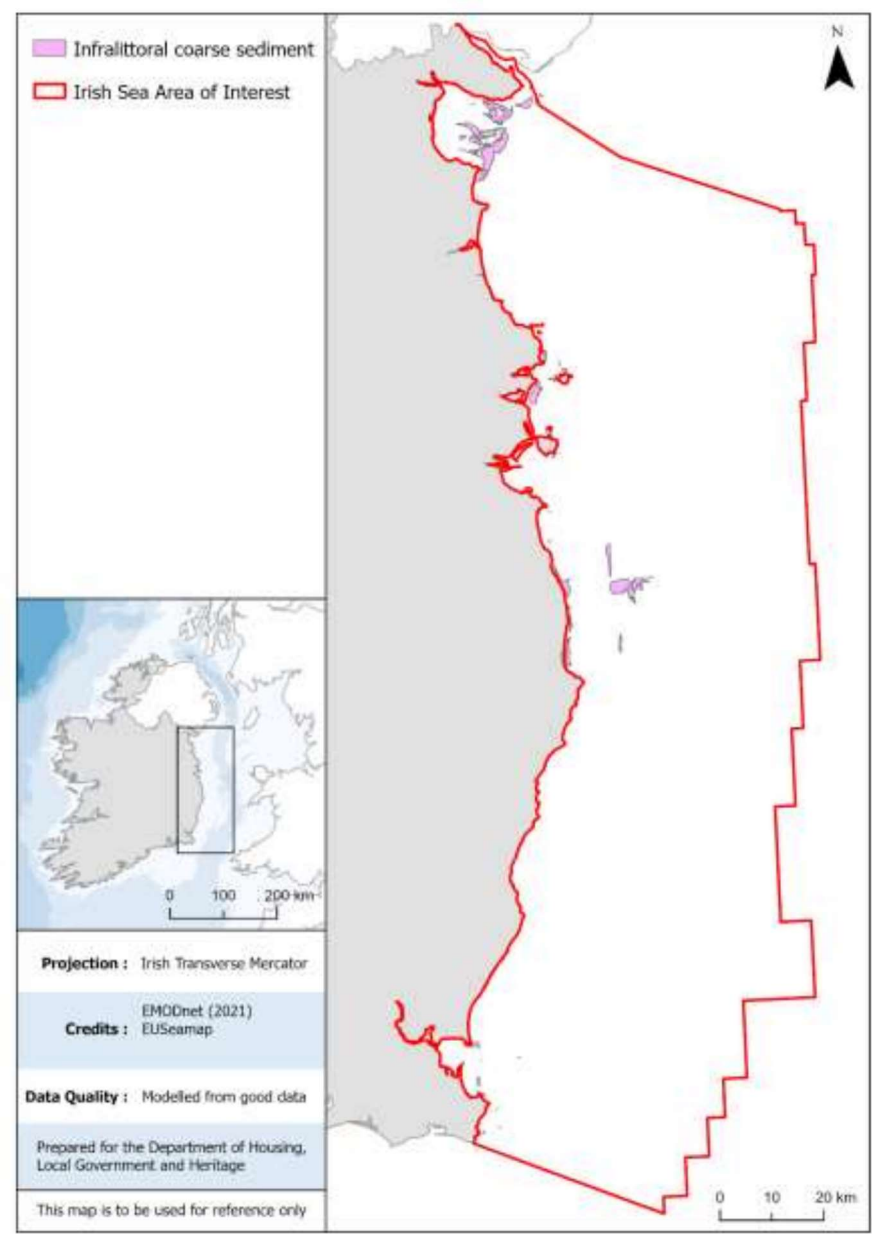


Figure 1. Data available for infralittoral coarse sediments in the western Irish Sea.

Data sources and quality

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

Hill, J.M. (2006). *Ensis ensis* Common razor shell. In Tyler-Walters H. and Hiscock K. *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*, [online]. Plymouth: Marine Biological Association of the United Kingdom. [cited 22-04-2023]. Available from: <https://www.marlin.ac.uk/species/detail/1419>

Hill, J.M. (2008). *Echinocardium cordatum* Sea potato. In Tyler-Walters H. and Hiscock K. *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*, [online]. Plymouth: Marine Biological Association of the United Kingdom. [cited 22-04-2023]. Available from: <https://www.marlin.ac.uk/species/detail/1417>

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

Smith, J.E. (ed.), (1968). 'Torrey Canyon'. *Pollution and marine life*. Cambridge: Cambridge University Press.

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