31. Offshore circalittoral mixed sediment

Background

Offshore (deep) circalittoral habitats with slightly muddy mixed gravelly sand and stones or shell occur at depths between 50 m and 200 m. This habitat may cover large areas of the offshore continental shelf although there are relatively few data available. Offshore circalittoral mixed sediment is often highly diverse, and characterised by high numbers 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 A10.31.1. Offshore circalittoral mixed sediment ecological groups. Characterising species within those groups on which each group sensitivity assessment was based are listed. For a full list of species characterizing each ecological group of subtidal sedimentary habitats, see Tillin & Tyler-Walters (2013). *evidence was lacking for *Amphipholis squamata* so the assessment of this ecological group was based on the similar species *Ophiothrix fragilis* and *Amphiura filiformis.*

Group number	Group description	Characterising species
Group 4	Infaunal very small to medium sized suspensions and/or deposit feeding bivalves	*Timoclea ovata*
Group 5	Small-medium suspension and/or deposit feeding polychaetes	*Chaetozone zetlandica, Dipolydora caulleryi*
Group 6	Predatory polychaetes	*Glycera lapidum*
Group 8(c)	Ophiuroids (free-living interface suspension/deposit feeders)	*Amphipholis squamata**

Rationale for spatial protection in the Celtic Sea

Offshore circalittoral mixed sediment was included in the features list as it is a Marine Strategy Framework Directive (MSFD) priority habitat and is a broadly distributed feature of ecological importance within the Celtic Sea. This habitat hosts a wide range of species, contributing to the biodiversity of Irish waters. 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

Offshore circalittoral mixed sediment is highly sensitive to pressures associated with the construction and operation of offshore wind farms. All marine habitats and benthic species are considered to be highly sensitive to the pressure physical loss (to land of freshwater habitat), with a resistance of None and no resilience. Offshore circalittoral mixed sediment is highly sensitive to change to another seabed type. A permanent change from sediment to artificial hard substratum would change the habitat classification, meaning a resistance and resilience of None. Species in ecological group 5 were assessed as highly sensitive to 'habitat structure change-removal of substratum (extraction)', 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 *D. caulleryi* and *C. 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 sediment is moderately sensitive to pressures associated with the fishing sector. 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 surface abrasion although surface abrasion may damage and kill a proportion of the population. Members of ecological groups 4 & 5 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 group 8(c) are infaunal 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 arms 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 sediment 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). All of these pressures are also associated with ORE and fishing. Further research is needed on the sensitivity of this habitat to these pressures and the shipping sector.

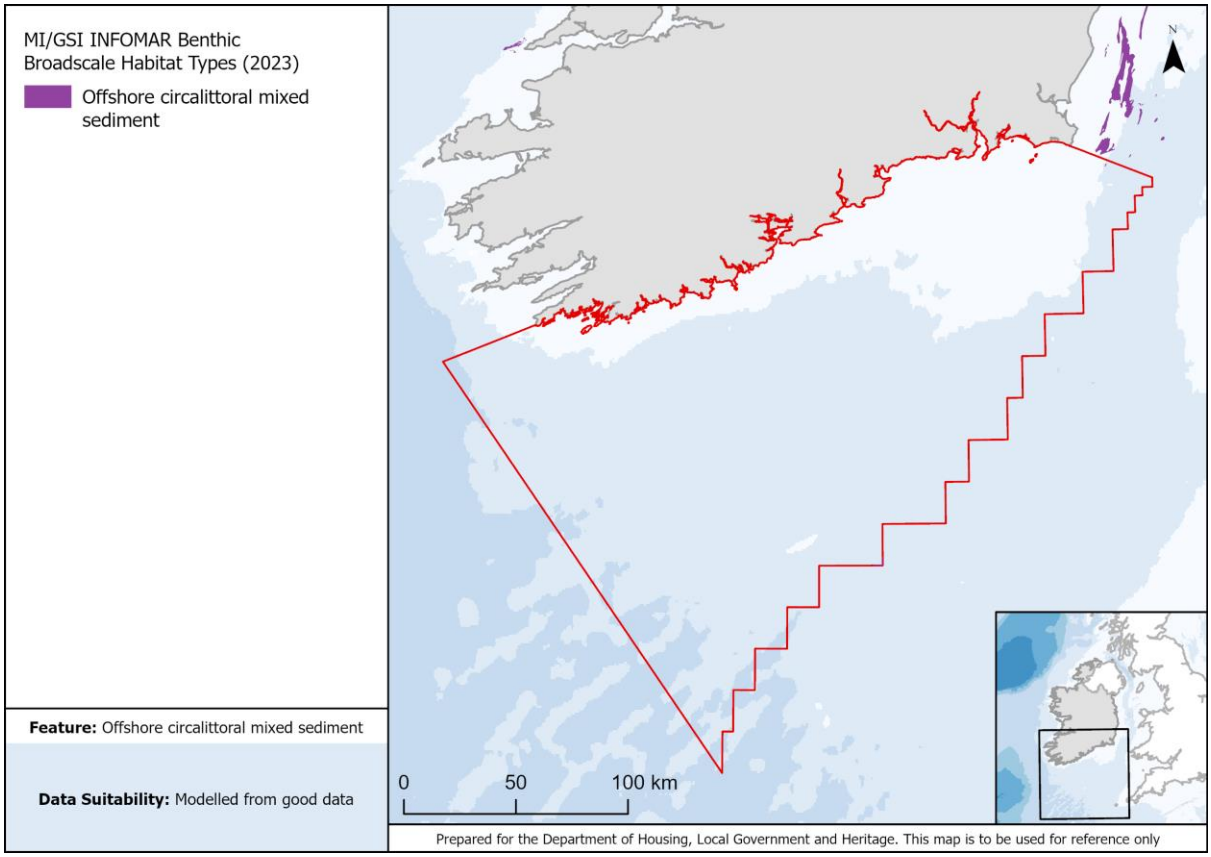

Figure A10.31.1. Data available for offshore circalittoral mixed sediment in the Celtic Sea.

Data sources available

See Figure A10.31.1 for data available for this broadscale habitat type in the Celtic Sea. This layer was used in prioritization analyses.

Further research needs

As with other MSFD broadscale habitats, better evidence is needed as to which species particularly characterise this habitat in the Celtic Sea. In addition, several 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. Many pressures are not assessed for this habitat. Further research is needed to assess the sensitivity of the full list of characterising species present to provide a more comprehensive analysis for each ecological group. Genetic data on characterising species could help identify populations with

high genetic variability or distinctness, and provide information on connectivity among populations. An integrated approach where genetic data are used in combination with sensitivity and conservation prioritization analyses could provide more comprehensive spatial protection.

References

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