27. Offshore circalittoral coarse sediment

Background

Offshore (deep) circalittoral habitats with coarse sands and gravel or shell occur between depths of 20 m to 200 m. Characterised by robust infaunal bivalve and polychaete species and a lack of epifaunal species, this habitat is quite diverse compared with shallower coarse sediments. Animal communities in this habitat are closely related to offshore mixed sediments and in some areas settlement of *Modiolus modiolus* larvae (horse mussel) may occur and consequently these habitats may occasionally have large numbers of juvenile *M. modiolus* (JNCC, 2022).

Table A10.27.1. Offshore circalittoral coarse 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). Sensitivity scores were obtained for selected species from [1] Ager (2008), for pressures not considered by Tillin & Tyler-Walters (2014), i.e., transition elements & organo-metal contamination, hydrocarbon & Polycyclic Aromatic Hydrocarbons (PAH) contamination, synthetic compound contamination, de-oxygenation, smothering and siltation changes (light).

Group number	Group description	Characterising species
Group 2	Temporary or permanently attached surface dwelling or shallowly buried larger bivalves	*Pecten maximus*
Group 4	Infaunal very small to medium sized suspensions and/or deposit feeding bivalves	*Thyasira flexuosa*
Group 5	Small-medium suspension and/or deposit feeding polychaetes	*Lanice conchilega*[1], *Chaetozone zetlandica, Dipolydora caulleryi*
Group 6	Predatory polychaetes	*Glycera lapidum, Protodorvillea kefersteini*

Rationale for spatial protection in the Celtic Sea

Offshore circalittoral coarse sediment Is included in the feature 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 coarse sediment is highly sensitive to pressures associated with the construction 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 coarse 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. This habitat has a moderate sensitivity to the operation of ORE. Ecological groups 2, 4, 5 and 6 have medium sensitivity to the pressure 'habitat structure change-removal of substratum (extraction)' (low confidence). The process of extraction is considered to remove all members of these ecological groups as they are either shallowly buried, sessile or slow moving. The scale of the disturbance and the suitability of the sedimentary habitat remaining will determine the speed of recovery. Ecological groups 2 and 4, which include suspension feeders, are moderately sensitive to a change in suspended solids (medium confidence). The benchmark for this pressure considers chronic change sustained for a year and such change is predicted to have negative impacts on growth and fecundity by reducing filter feeding efficiency and imposing costs on clearing and producing pseudofaeces in filter feeders. Ecological groups 2 and 4 are also moderately sensitive to heavy smothering and siltation changes (low confidence). Species in these groups are on the seabed or shallowly buried and would be buried with heavy siltation changes. The intensity and duration of siltation will be mediated by site-specific hydrodynamic conditions, such as water- flow and wave action. Based on laboratory studies by Last et al. (2011) and Szostek et al. (2013), species in ecological group 2 are considered unable to vertically migrate through a layer of deposited sediment at the pressure benchmark level, that is, 30 cm of fine material and therefore have been assessed as highly sensitive (Tillin & Tyler-Walters, 2014).

Offshore circalittoral coarse sediment is moderately sensitive to pressures associated with the fishing sector. Ecological groups 2, 4 and 5 have a medium sensitivity to abrasion of the surface and penetration of the subsurface (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 these

ecological groups will also be directly impacted by penetration and disturbance of the substratum below the surface. As mentioned previously, this habitat is also moderately sensitive to a change in suspended solids (medium confidence) (Tillin & Tyler-Walters, 2014).

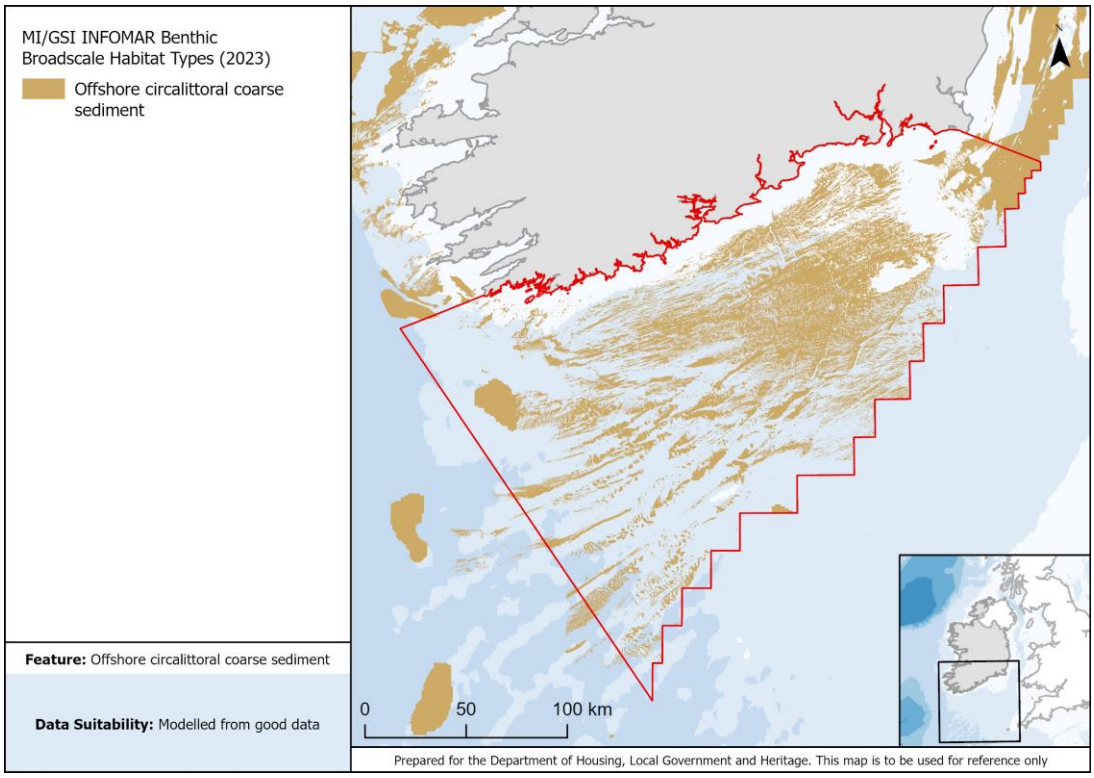

Figure A10.27.1. Data available for offshore circalittoral coarse sediment in the Celtic Sea.

Offshore circalittoral coarse sediment is moderately sensitive to 'synthetic compound contamination' associated with shipping. It must be stressed that this assessment is based on one characterising species only due to a lack of evidence on the remaining species. Based on evidence from another polychaete species, *Hediste diversicoloris,* it is assumed that *Lanice conchilega* has a medium sensitivity to synthetic compound contamination (Ager, 2008). This pressure is also associated with ORE and fishing.

Data sources available

See Figure A10.27.1 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 were not assessed for this habitat, particularly chemical pressures. 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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