30. Offshore circalittoral sand

Background

Offshore (deep) circalittoral habitats with fine sands or non-cohesive muddy sands occur between depths of 20-200 m. Very few data are available on these habitats however they are likely to be more stable than their shallower counterparts and characterised by a diverse range of polychaetes, amphipods, bivalves, and echinoderms (JNCC, 2022).

Table A10.30.1. Offshore circalittoral sand ecological groups. Characterising species within those groups on which each group sensitivity assessment was based are listed. For a full list of species characterising each ecological group of subtidal sedimentary habitats, see Tillin & Tyler-Walters (2013). Sensitivity scores were obtained for selected species from [1] Ager (2008), [2] Hill & Wilson (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 4	Infaunal very small to medium sized suspensions and/or deposit feeding bivalves	*Abra alba*
Group 5	Small-medium suspension and/or deposit feeding polychaetes	*Scoloplos armiger, Lanice conchilega*[1]
Group 7	Very small to small, short lived (<2 years) free-living species defined on size and feeding type	*Eudorellopsis deformis*
Group 8(c)	Ophiuroids (free-living interface suspension/deposit feeders)	*Amphiura filiformis*[2]

Rationale for spatial protection in the Celtic Sea

Offshore circalittoral sand is 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 sand 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 sand 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 4, 5 and 8(c) are moderately sensitive to 'habitat structure change-removal of substratum (extraction)' (low confidence). The process of extraction will remove all members of these ecological groups, as they either live on the surface or are shallowly buried, and resistance is assessed as None. Recovery for each of the groups is expected to occur within 2-10 years (resilience is Medium), resulting in medium sensitivity. Group 4 is also moderately sensitive to a change in suspended solids. This ecological group is not predicted to be sensitive to acute changes in turbidity. However, the pressure benchmark involves chronic change sustained for a year, which 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 (Tillin & Tyler-Walters, 2014).

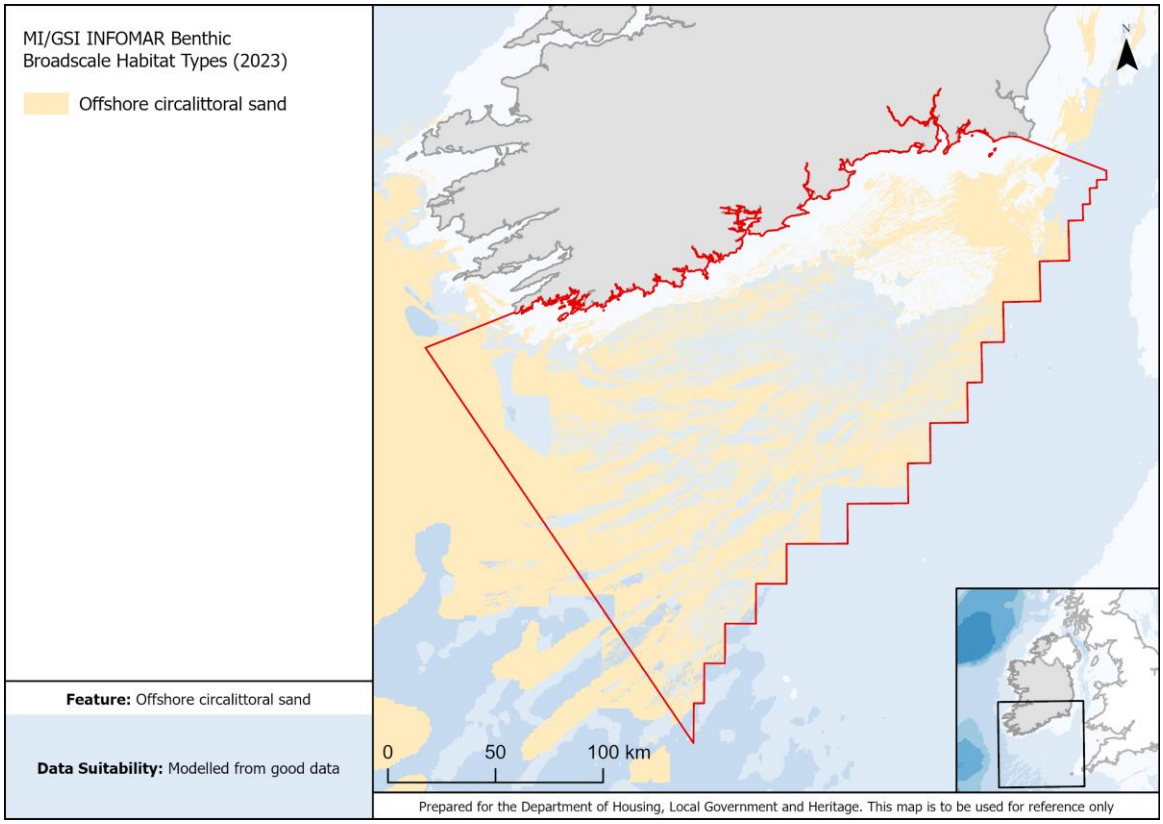

Figure A10.30.1. Data available for offshore circalittoral sand in the Celtic Sea.

Offshore circalittoral sand is moderately sensitive to pressures associated with the fishing sector. Ecological groups 4 and 8(c) have a medium sensitivity to the pressures 'abrasion/disturbance of substratum surface or seabed' and 'penetration or disturbance of substratum subsurface' (medium confidence). Species of group 4 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 this ecological group 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 this group are epifaunal 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).

Offshore circalittoral sand is moderately sensitive to pressures associated with the shipping sector (medium confidence). This assessment is based on one characterising species only due to a lack of evidence on the remaining species. *Amphiura filiformis* has a medium sensitivity to hydrocarbon and PAH contamination (medium confidence) and a

medium sensitivity to synthetic compound contamination (low confidence)(Hill & Wilson, 2008).

Data sources available

See Figure A10.30.1 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 one 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 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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