

## 22. Circalittoral sand

### Background

Clean fine sands with less than 5% silt/clay in deeper water, either on the open coast or in tide-swept channels of marine inlets in depths of over 15-20 m to a max depth of 50 m. The habitat may also extend offshore and is characterised by a wide range of echinoderms (including the sea urchin (*Echinocyamus pusillus*), polychaetes and bivalves. This habitat is generally more stable than shallower, infralittoral sands and consequently supports a more diverse community (JNCC, 2022).

Table A10.22.1. 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 (2005), [2] Neal & Avant (2008) for pressures not accessed by Tillin & Tyler-Walters (2014), i.e., transition elements & organo-metal contamination, hydrocarbon & Polycyclic Aromatic Hydrocarbons (PAH) contamination, synthetic compound contamination, introduction of other substances, deoxygenation, 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	<i>Abra prismatica</i> , <i>Timoclea ovata</i>
Group 5	Small-medium suspension and/or deposit feeding polychaetes	<i>Spiophanes bombyx</i> <sup>[1]</sup> , <i>Owenia fusiformis</i> <sup>[2]</sup>
Group 6	Predatory polychaetes	<i>Glycera lapidum</i>
Group 7	Very small-small, short lived (<2 years) free-living species	<i>Bathyporeia elegans</i> , <i>Eudorellopsis deformis</i>
Group 8(a)	Subsurface dwelling echinoids	<i>Echinocyamus pusillus</i>

### Rationale for spatial protection in the Celtic Sea

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 the Celtic Sea. Broad-scale 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**

**Circalittoral sand is sensitive to pressures associated with the construction and operation of offshore wind farms.** Loss of the physical habitat will result in a loss of biodiversity and lead to changes in the community structure associated with this habitat (high confidence). Circalittoral sand has a medium sensitivity (low confidence) to pressures associated with the operation of ORE, including the physical change of the sediment type and removal of substratum. 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). 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, several of the ecological groups (4, 5, 6 & 8(a)) consist of shallowly buried species and removal of substratum would result in all individuals within the extraction footprint being removed (Tillin & Tyler-Walters, 2014).

**Circalittoral sand is moderately sensitive to pressures associated with the fishing sector.** Species of ecological group 4 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. However, the small size of members of this ecological group will confer some level of resistance. Gilkinson *et al.* (1998) simulated the physical interaction of otter trawl doors with the seabed and between 58% and 70% of the bivalves in the scour path that were originally buried were completely or partially exposed at the test bed surface. However, only two out of 42 specimens showed major damage. The pressure wave associated with the otter door pushes small bivalves out of the way without damaging them. Where species can rapidly burrow and reposition (typically within species occurring in unstable habitats) before predation, mortality rates will be relatively low (Tillin & Tyler-Walters, 2014). Sensitivity to 'changes in suspended solids' is also assessed as medium for group 4 (low confidence). Ecological group 4 is not predicted to be sensitive to acute changes in turbidity. However, the pressure benchmark is chronic change in suspended solids sustained for a year, and 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 filter feeders (Tillin & Tyler-Walters, 2014).

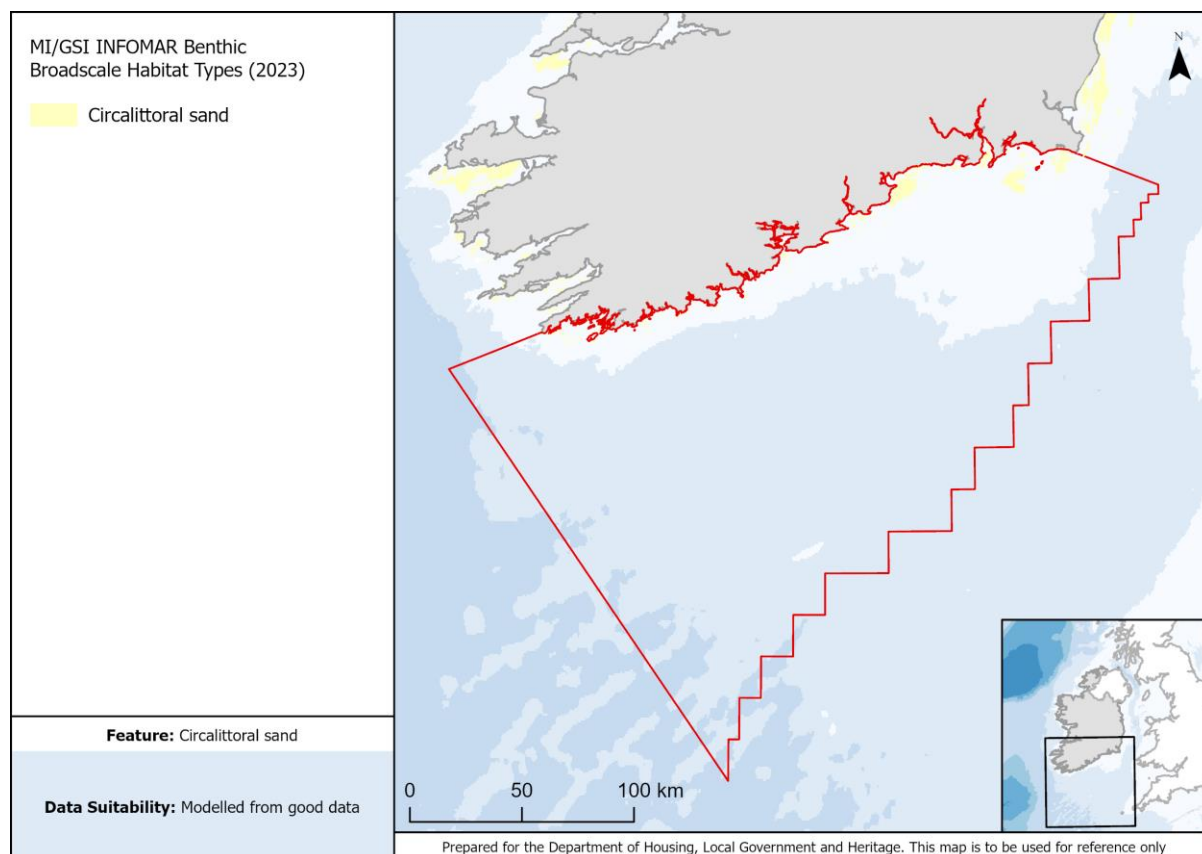


Figure A10.22.1. Data available for circalittoral sand in the Celtic Sea.

**Circalittoral sand is moderately sensitive to pressures 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 similar polychaete species, *Spiophanes bombyx* is assumed to have a medium sensitivity to synthetic compound contamination (Ager, 2005).

#### Data sources available

See Figure A10.22.1 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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