



NORTH FALLS

Offshore Wind Farm

Marine Conservation Zone Assessment

Appendix 2 – Biotope Sensitivity Ranges

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PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

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1 MarESA Biotope Sensitivity

1.1 Introduction

1. The impact assessment presented in the North Falls Preliminary Marine Conservation Zone Assessment (MCZA) Stage 1 Assessment uses Natural England's Advice on Operations (AoO) for the Blackwater, Crouch, Roach and Colne (BCRC) Estuaries, the Kentish Knock East and the Orford Inshore MCZ's in relation to the sensitivity of the biotopes associated with the protected features of the MCZs. The definition of sensitivity used by Natural England's Conservation Advice Package for the BCRC Estuaries, the Kentish Knock East and the Orford Inshore MCZ's are based on Marine Life Information Network (MarLIN's) Marine Evidence based Sensitivity Assessment (MarESA) (Tyler-Walters et al., 2018). MarESA determines sensitivity based on resistance (tolerance) and resilience (recoverability) which are defined as:
 - Resistance: the likelihood of damage (termed intolerance or resistance) due to a pressure;
 - Resilience: the rate of (or time taken for) recovery (termed recoverability, or resilience) once the pressure has abated or been removed.
2. Descriptions of Resistance and Resilience are presented in Table 1.1 below.

Table 1.1 Resistance and resilience scale definitions

Level	Description
Resistance (Tolerance)	
None	Key functional, structural, characterising species severely decline and/or physicochemical parameters are also affected e.g. removal of habitats causing a change in habitats type. A severe decline/reduction relates to the loss of 75% of the extent, density or abundance of the selected species or habitat component e.g. loss of 75% substratum (where this can be sensibly applied).
Low	Significant mortality of key and characterising species with some effects on the physicochemical character of habitat. A significant decline/reduction relates to the loss of 25-75% of the extent, density, or abundance of the selected species or habitat component e.g. loss of 25-75% of the substratum.
Medium	Some mortality of species (can be significant where these are not keystone structural/functional and characterising species) without change to habitats relates to the loss <25% of the species or habitat component.
High	No significant effects on the physicochemical character of habitat and no effect on population viability of key/characterising species but may affect feeding, respiration and reproduction rates.
Resilience (Recovery)	
Very Low	Negligible or prolonged recovery possible; at least 25 years to recover structure and function.
Low	Full recovery within 10-25 years.
Medium	Full recovery within 2-10 years.
High	Full recovery within 2 years.

3. The MarESA assessment of sensitivity is guided by the presence of key structural or functional species/assemblages and/or those that characterise the biotope groups. Physical and chemical characteristics are also considered

where they structure the community. MarESA uses a matrix approach to determine sensitivity based on both recovery and resilience. The sensitivity matrix used in the impact assessment in the MCZA based on MarESA, is presented in Table 1.2.

Table 1.2 Sensitivity matrix

		Resistance (Tolerance)			
		None	Low	Medium	High
Resilience (Recovery)	High	High	High	Medium	Low
	Medium	High	High	Medium	Low
	Low	Medium	Medium	Medium	Low
	Negligible	Medium	Low	Low	Negligible

1.2 Sensitivity Assessment

4. Table 1.3 sets out the MarESA sensitivity assessment of biotopes and species associated with the protected features of the BCRC Estuaries MCZ. The following biotope and species have been used for the MCZA:
 - A5.435 – *Ostrea edulis* beds on shallow sublittoral muddy mixed sediment
 - Native oyster *Ostrea edulis*
5. Table 1.4 sets out the MarESA sensitivity assessment of biotopes associated with the protected features of the Kentish Knock East MCZ. The following biotopes have been used for the MCZA:
 - Subtidal sand: A5.231 – Infralittoral mobile clean sand with sparse fauna
 - Subtidal mixed sediments: A5.422 – *Crepidula fornicata* and *Mediomastus fragilis* in variable salinity infralittoral mixed sediment (A5.451 Polychaete-rich Venus community in offshore mixed sediments has been used to assess the effects of Invasive Non-Native Species (INNS)).
 - Subtidal coarse sediment: A5.135 – *Glycera lapidum* in impoverished infralittoral mobile gravel and sand has been used as a proxy for infralittoral coarse sediment.
6. A Conservation Advice Package is not available for the Orford Inshore MCZ protected feature, therefore, Kentish Knock East MCZ has been used as a proxy for this designated site within the MCZA.

Table 1.3 Sensitivity ranges for the potential features associated with the BCRC Estuaries MCZ, in relation to the pressures screened into the Stage 1 assessment. NS = Not Sensitive at the benchmark; IE = Insufficient Evidence to assess NR= Not relevant, as determined by Natural England’s AoO; and NA = Not Assessed by Natural England (Natural England, 2022)

Potential pressure (screening)	Pressure (AoO)	Native oyster <i>Ostrea edulis</i> beds	Native oyster <i>Ostrea edulis</i>
Increased suspended sediment concentrations	Changes in suspended solids (water clarity)	NS	High
	Smothering and siltation rate changes (Light)	High	High
Re-mobilisation of contaminated sediments	Hydrocarbon & PAH contamination	NA	NA
	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	NA	NA
	Transition elements & organo-metal (e.g. TBT) contamination	NA	NA
Sediment deposition (smothering)	Smothering and siltation rate changes (Light)	High	High
Invasive species	Introduction or spread of invasive non-indigenous species (INIS)	High	High

Table 1.4 Sensitivity ranges for the potential features associated with the Kentish Knock East MCZ, in relation to the pressures screened into the Stage 1 assessment. NS = Not Sensitive at the benchmark; IE = Insufficient Evidence to assess; NR= Not relevant, as determined by Natural England’s AoO; and NA = Not Assessed by Natural England (Natural England, 2022)

Potential pressure (screening)	Pressure (AoO)	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand
Temporary physical disturbance	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Low	Low	Low
	Abrasion/disturbance of the substrate on the surface of the seabed	Low	Low	Low
Permanent/long term habitat loss	Habitat structure changes – removal of substratum (extraction)	Medium	Medium	Medium
	Physical loss (to land or freshwater habitat)	High	High	High

Potential pressure (screening)	Pressure (AoO)	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand
	Physical change (to another seabed type)	High	High	High
	Physical change (to another sediment type)	High	High	High
Increased suspended sediment concentrations	Changes in suspended solids (water clarity)	NS	NS	Low
	Smothering and siltation rate changes (Light)	Low	Low	NS
	Smothering and siltation rate changes (Heavy)	Medium	Low	Low
Re-mobilisation of contaminated sediments	Hydrocarbon & PAH contamination	NA	NA	NA
	Synthetic compound contamination (incl. pesticides, antifoulants, pharmaceuticals)	NA	NA	NA
	Transition elements & organo-metal (e.g. TBT) contamination	NA	NA	NA
	Introduction of other substances (solid, liquid or gas)	NA	NA	NA
Effects on bedload sediment transport	Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Low	Low	Low
	Abrasion/disturbance of the substrate on the surface of the seabed	Low	Low	Low
Underwater noise and vibration	Underwater noise changes	NR	NS	NS
Colonisation of foundations and cable protection	Introduction or spread of invasive non-indigenous species (INIS)	High	High	NS

Potential pressure (screening)	Pressure (AoO)	Subtidal coarse sediment	Subtidal mixed sediments	Subtidal sand
Invasive species	Introduction or spread of invasive non-indigenous species (INIS)	High	High	NS
Electromagnetic fields	Electromagnetic changes	IE	IE	IE

1.3 References

Natural England (2022) Blackwater, Crouch, Roach and Colne Estuaries MCZ Advice on Operations.

Available at:

<https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.spx?SiteCode=UKMCZ0003&SiteName=Blackwater%2c+Crouch%2c+Roach+and+Colne+Estuaries+MCZ&SiteNameDisplay=Blackwater%2c+Crouch%2c+Roach+and+Colne+Estuaries+MCZ&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=>

Natural England (2022) Kentish Knock East MCZ Advice on Operations. Available at:

<https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UKMCZ0080&SiteName=kentish+knock&SiteNameDisplay=Kentish+Knock+East+MCZ&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=>

Tillin, H.M. (2022). Polychaete-rich deep Venus community in offshore gravelly muddy sand. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 22-12-2022]. Available from:

<https://marlin.ac.uk/habitat/detail/1117>

TylerWalters, H., Tillin, H.M., d'Avack, E.A.S., Perry, F. & Stamp, T. (2018). Marine Evidence based Sensitivity Assessment (MarESA) A Guide. Marine Life Information Network (MarLIN). Marine Biological Association of the United Kingdom, Plymouth, 91 pp