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**Title of abstract: Assessing the significance of fishing and natural disturbance at local scales**

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Demersal trawling is one of the most significant and widespread pressures on seabed habitats, and therefore the fisheries sector is a key stakeholder in marine spatial planning initiatives. Assessments of the impact of trawling in European Marine Sites (EMS) have typically used generic gear definitions and coarse spatial scales that do not reflect the characteristics of the local fisheries nor fine-scale habitat differences. We developed an evidence-based approach to the assessment of fishing impacts, taking into consideration natural disturbance. We illustrate this with case studies of mobile demersal gears on sandbank habitats. The sensitivity of the habitats and characterising species to pressures from fishing was assessed based on existing evidence, including biological traits, using defined scales of tolerance and recoverability. The physical impacts from the fishing gears were modelled (sediment resuspension and depth of penetration) for individual gear components. Exposure to fishing was calculated using both a 'swept area' approach and by creating 'footprint polygons' based on tracks between consecutive VMS fishing pings for over-15m vessels, and through detailed interviews and mapping for under-15m vessels. A clear distinction was drawn between the different pressures caused by individual gear components, and linked to the spatial extent of impact. Modelling of the occurrence of mobile sand ripples allowed fishing disturbance to be considered in the context of levels of natural disturbance. Consideration of the significance of fishing impacts in the context of natural disturbance in EMS enables the achievement of both fishing and environmental objectives in a marine spatial planning context.

**Keywords:** fishing disturbance, natural disturbance, fishing impacts, numerical modelling

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