



# Extent of Physical Damage to Predominant and Special Habitats



MSFD Descriptors: 1 - Biological diversity; 6 - Seafloor integrity

MSFD Criteria: 1.6 - Habitat condition; 6.1 - Physical damage, having regard to substrate characteristics

**Key Message** Bottom contacting fishing physically disturbs seafloor habitats. 86% of the assessed areas in the Greater North Sea and the Celtic Seas have physical disturbance, of which 58% showed higher disturbance. 74% of all assessed areas experience consistent pressure year on year, which is very likely to affect the ability of habitats to recover

## Background

Benthic habitats are formed of marine organisms living on or within the sediment and on rock. They undertake essential ecological processes and functions to support healthy ecosystems. They are a key component of the marine food web, including commercial fish and shellfish species, and provide a major food source for predators. The diversity of seafloor habitats is shaped by factors such as depth, light penetration, substrate type and their flora and fauna communities. These create a huge variety of habitat types, with communities showing different levels of sensitivity to physical damage. Some are very sensitive (e.g. fragile coral gardens), whereas others are more robust (e.g. mobile sands). Physical disturbance of the seafloor by human activities such as bottom contacting fishing, aggregate extraction or offshore construction can adversely affect benthic habitats, especially those with larger and fragile species and those with longer recovery time. This Indicator aims to help assess the current spatial extent and level of physical disturbance that human activities have caused to the seafloor.

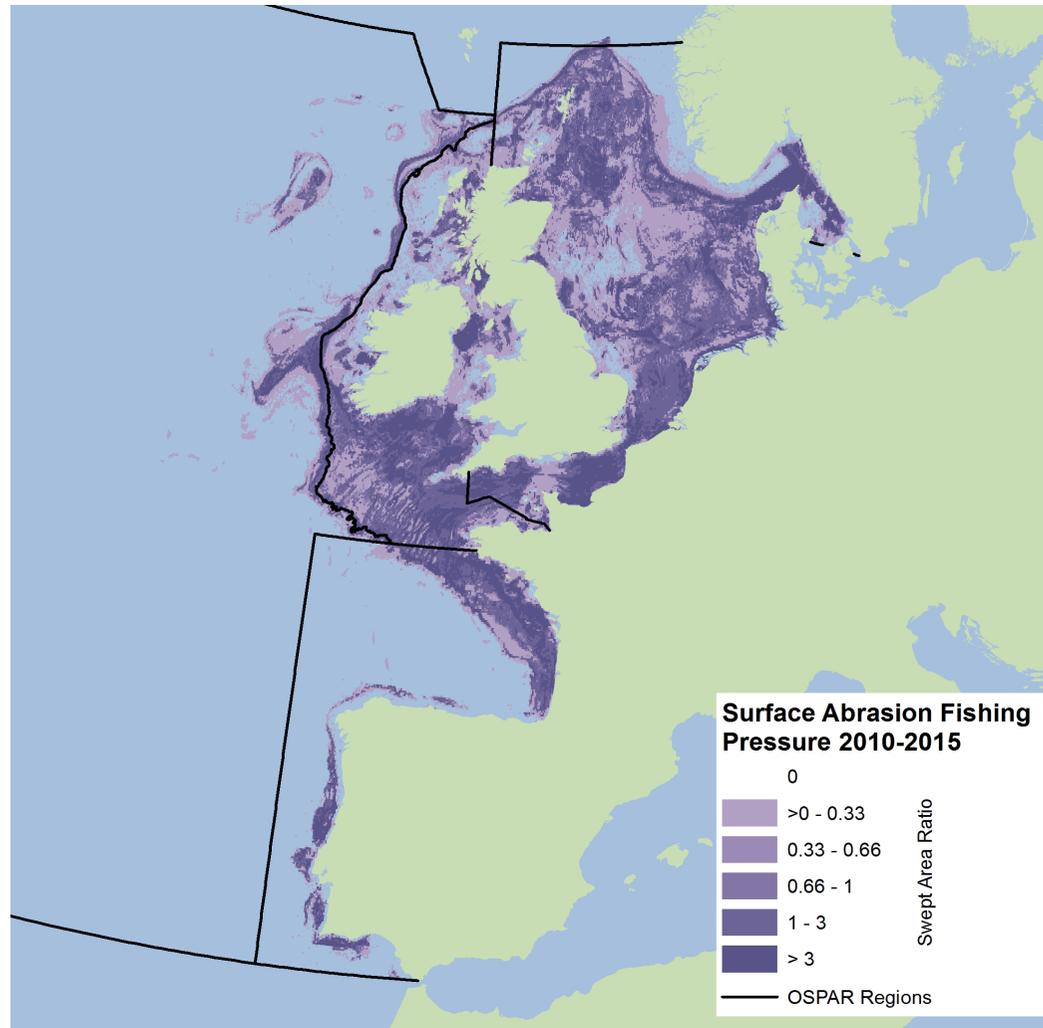


Figure 1: Aggregated surface abrasion pressure using the 2010–2015 data series. Pressure unit is swept area ratio (the proportion of grid cell swept by fishing gear)  
*The hatched area around the UK shows the areas where inshore fisheries activity from vessels <12 m in length is higher than those >12 m in length*

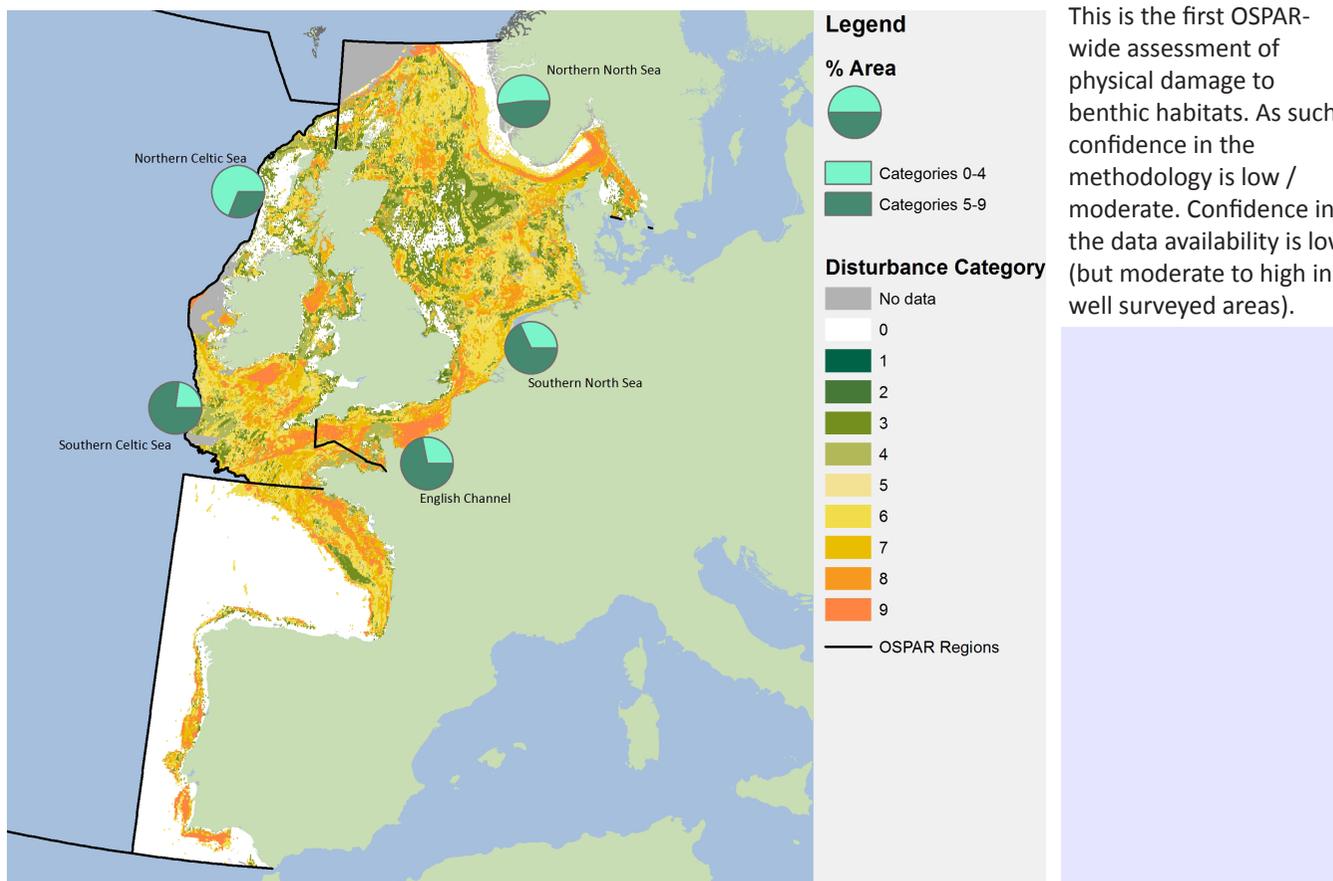
## Results

This initial assessment of the Indicator shows the distribution and intensity of pressure from bottom-contact fishing activity and the associated disturbance to the seafloor at the OSPAR regional scale. The approach uses a combination of semi-quantitative and categorical approaches of the pressure / impact relationship between habitats and fishing. A fully quantitative method is not possible at this stage as it would limit results to small-scale locations, or where long-term datasets are available.

**Figure 1** shows the distribution of surface abrasion caused by vessels over 12 m in length fishing with bottom contacting gears, aggregated for the years 2010 to 2015. Areas with low levels of fishing-induced surface abrasion or none at all (e.g. north-west of Northern Ireland) are distinguished from those with higher levels of activity (e.g. the English Channel, Skagerrak and Kattegat). Overall, 74% of grid cells assessed experienced consistent pressure year on year, with the remaining 26% showing high levels of variability (a change of three categories or more on the fishing pressure in the same grid across years is considered to be highly variable). This is an important factor for subsequent analysis of disturbance, because how pressure varies over time will affect the ability of habitats to recover. This means that areas with high levels of variability will be at different stages of recoverability and impact.

## Results cont...

**Figure 2** shows the aggregated values for surface and sub-surface seafloor disturbance for the period 2010–2015. The highest level of disturbance is found in the Southern Celtic Seas with 76% of this area subject to high disturbance (categories 5–9). The extent of disturbance in the English Channel and the Southern North Sea is slightly lower, 72% and 68% respectively. Within each assessment area there are grid cells showing no disturbance or low disturbance (categories 0–4), such as some central areas of the Northern North Sea.



## Conclusion

The assessment covers the period 2010–2015. It shows that up to 86% of the grid cells assessed in the Greater North Sea and Celtic Seas show evidence of some physical disturbance of the seafloor from bottom contacting fishing gears, of which 58% of areas show higher levels of disturbance. Areas assessed in the Celtic Seas and the English Channel have higher levels of disturbance than other regions. The amount of pressure across the six-year assessment period is not always consistent, with a quarter of the assessed grid cells showing high variability in pressure. This is particularly evident in the Greater North Sea. Surface pressure is evenly distributed across the assessed grid cells, whereas the highest level of sub-surface pressure is found along the southern and eastern coasts of the Southern North Sea from Northern France to the Kattegat.

Overall there are no clear trends across habitats or regions. The results do not take account of pre-2010 benthic fishing activity, which may have affected areas showing low disturbance or which are subject to pressures from other activities.

The spatial distribution of disturbance values could be used alongside the trend analysis to guide discussion on potential management.

## Knowledge Gaps

During the next assessment cycle the aim is to move towards more quantitative approaches. Achieving this will require attention to the following points: availability and accessibility of habitat survey data; the lack of data from small fisheries and other activities causing physical damage (e.g. sand extraction and offshore construction); a review of the sensitivity method to strengthen Step 2; refinement of the disturbance matrix to strengthen Step 4; calculation of a final physical damage index per habitat type and sub-region to strengthen Step 5; and a better understanding of the impacts of different fishing gear types.

**Figure 2: Spatial distribution of aggregated disturbance using the 2010–2015 data series across OSPAR sub-regions**

Disturbance categories 0–9, with 0= no disturbance and 9= highest disturbance. Plots show percentage area of OSPAR sub-regions in disturbance categories 0–4 (none or low disturbance) and 5–9 (high disturbance) across reporting cycle (2010–2015). The percentage was not included for the Bay of Biscay and Iberian Coast due to the lack of complete data

This document was published as part of OSPAR's Intermediate Assessment 2017.

The full assessment can be found at [www.ospar.org/assessments](http://www.ospar.org/assessments)