

INFOGRAPHICS *IMPACTS OF BOTTOM TRAWLING*

Sources of information

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- Amoroso, R. O., Pitcher, C. R., Rijnsdorp, A. D., McConnaughey, R. A., Parma, A. M., Suuronen, P., ... & Jennings, S. (2018). Bottom trawl fishing footprints on the world's continental shelves. *Proceedings of the National Academy of Sciences*, 115(43), E10275-E10282.
- Benyon, R., P. Barham, J. Edwards, M. Kaiser, S. Owens, N. de Rozarieux, C. Roberts & B. Sykes (2020). *Benyon Review into Highly Protected Marine Areas. Final Report*.
- Duarte, C. M., Middelburg, J. J., & Caraco, N. (2005). Major role of marine vegetation on the oceanic carbon cycle. *Biogeosciences*, 2(1), 1-8.
- Eigaard, O. R., Bastardie, F., Hintzen, N. T., Buhl-Mortensen, L., Buhl-Mortensen, P., Catarino, R., Dinesen, G. E., ... & Royo Gelabert, E. (2017). The footprint of bottom trawling in European waters: distribution, intensity, and seabed integrity. *ICES Journal of Marine Science*, 74: 847–865.
- European Commission (2020). *Review of the status of the marine environment in the European Union Towards clean, healthy and productive oceans and seas – Accompanying the Report from the Commission to the European Parliament and the Council on the implementation of the Marine Strategy Framework Directive (Directive 2008/56/EC)*. SWD (2020) 61 final PART 3/3, 25 June 2020.
- European Environment Agency (2019). *Marine messages II: Navigating the course towards clean, healthy and productive seas through implementation of an ecosystem-based approach*.
- European Environment Agency (2019). *The European Environment—State and Outlook 2020: Knowledge for Transition to a Sustainable Europe*.
- FAO (2020). *The State of Mediterranean and Black Sea Fisheries 2020. General Fisheries Commission for the Mediterranean*. Rome.
- Fournier, N., Garcia, S., Blanco, J. (2020). *Habitat protection under the Mediterranean Sea Regulation: A missed opportunity?* Oceana, Brussels.
- HELCOM (n.d.) *STATE OF THE BALTIC SEA – Second HELCOM holistic assessment 2011–2016. Benthic habitats*
- <https://ethic.es/2018/07/el-ultimo-respiro-de-la-posidonia-mediterranea/>
- <https://www.iucnredlist.org/regions/mediterranean>
- <https://www.theoceanpreneur.com/travel-by-sail/sailing-sustainability/what-is-posidonia-oceanica/>
- <https://www.unep.org/news-and-stories/story/seagrass-secret-weapon-fight-against-global-heating>
- ICES (2017). *EU request on indicators of the pressure and impact of bottom-contacting fishing gear on the seabed, and of trade-offs in the catch and the value of landings*. ICES Special Request Advice, eu.2017.13. 27 pp. <https://doi.org/10.17895/ices.advice.5657>
- ICES (2017). *Greater North Sea Ecoregion – Fisheries overview*. ICES Fisheries Overviews, ICES Advice 2017. DOI: 10.17895/ices.pub.3721
- ICES (2021). *ICES advice to the EU on how management scenarios to reduce mobile bottom fishing disturbance on seafloor habitats affect fisheries landing and value*. In Report of the ICES Advisory Committee, 2021. ICES Advice 2021. sr.2021.08. <https://doi.org/10.17895/ices.advice.8191>
- [kelp-graphic.png](https://sussexwildlifetrust.org.uk/kelp-graphic.png) (sussexwildlifetrust.org.uk) <https://assets.sussexwildlifetrust.org.uk/kelp-graphic.png>
- Korpinen, S., Klančnik, K., Peterlin, M., Nurmi, M., Laamanen, L., Zupancic, G., ... & Gelabert, E. R. (2020). *Multiple pressures and their combined effects in Europe's seas*.

- Mcleod, E., Chmura, G. L., Bouillon, S., Salm, R., Björk, M., Duarte, C. M., ... & Silliman, B. R. (2011). A blueprint for blue carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO₂. *Frontiers in Ecology and the Environment*, 9(10), 552-560.
- New Economics Foundation (2021). *Valuing the Impact of a Potential Ban on Bottom-Contact Fishing in EU Marine Protected Areas*.
- Olsgard, F., Schaanning, M. T., Widdicombe, S., Kendall, M. A., & Austen, M. C. (2008). Effects of bottom trawling on ecosystem functioning. *Journal of Experimental Marine Biology and Ecology*, 366(1-2), 123-133.
- OUR SEAS <https://www.ourseas.scot/frequently-asked-questions/>
- Perry, A. L., Blanco, J., Fournier, N., Garcia, S. & Marín, P. (2020). *Unmanaged = Unprotected: Europe's marine paper parks*. Oceana, Brussels.
- Pessarrodona, A., Moore, P. J., Sayer, M. D., & Smale, D. A. (2018). Carbon assimilation and transfer through kelp forests in the NE Atlantic is diminished under a warmer ocean climate. *Global Change Biology*, 24(9), 4386-4398.
- RPA (2020). The value of restored UK seas. Final Report for WWF, July 2020, Norfolk.
- Ruiz, J. M., Guillén, J. E., Ramos Segura, A., & Otero, M. (2015). *Atlas de las praderas marinas de España*. Madrid: Instituto Español de Oceanografía.
- Sala, E., Mayorga, J., Bradley, D., Cabral, R. B., Atwood, T. B., Auber, A., ... & Lubchenco, J. (2021). Protecting the global ocean for biodiversity, food and climate. *Nature*, 592(7854), 397-402.
- Sciberras, M., Hiddink, J. G., Jennings, S., Szostek, C. L., Hughes, K. M., Kneafsey, B., ... & Kaiser, M. J. (2018). Response of benthic fauna to experimental bottom fishing: A global meta-analysis. *Fish and Fisheries*, 19(4), 698-715.
- Small-scale fisheries (europa.eu) https://ec.europa.eu/oceans-and-fisheries/fisheries/rules/small-scale-fisheries_en
- Storey, N. R. (2011). *Little Book of Norfolk*. The History Press.
- Sussex IFCA (2021). *Nearshore Trawling Byelaw 2019 - Summary of Management Measures*.
- Svedäng, H. (2010). *Long-term impact of different fishing methods on the ecosystem in the Kattegat and Öresund*. Brussels: European Parliament, Policy Department B, Structural and Cohesion Policies.
- Thurstan R. H., Roberts C. M. (2010). Ecological Meltdown in the Firth of Clyde, Scotland: Two Centuries of Change in a Coastal Marine Ecosystem. *PLoS ONE* 5(7): e11767.
- Thurstan, R. H., Brockington, S., & Roberts, C. M. (2010). The effects of 118 years of industrial fishing on UK bottom trawl fisheries. *Nature communications*, 1(1), 1-6.
- Waycott M., Duarte C. M., Carruthers T. J. B., Orth R. J., Dennison W. C., Olyarnik S., ... & S. L. Williams (2009). Accelerating loss of seagrasses across the globe threatens coastal ecosystems. *Proceedings of the National Academy of Sciences*, 106(30): 12377-12381
- What is Blue Carbon? (noaa.gov) <https://oceanservice.noaa.gov/facts/bluecarbon.html>

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