



Trawling impacts on mediterranean seagrass

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THERE IS GROWING CONCERN about the worldwide decline of seagrass meadows. The amplitude of the decline varies depending on the species, the area and the human pressure⁽¹⁾. In the Mediterranean Sea, loss of seagrass meadows is mainly due to coastal development, trawling (fishing with towed gear), pollution, anchoring, competition with invasive species and sea level rise⁽²⁾.

Trawling in the Mediterranean is probably the most severe and worrying current cause of loss of the seagrass *Posidonia oceanica*⁽³⁾. In theory, trawling is prohibited between 0 and 50-100 metres depth and/or within the ca. 5,600 m coastal strip in almost all Mediterranean countries. However, this legislation is rarely enforced.

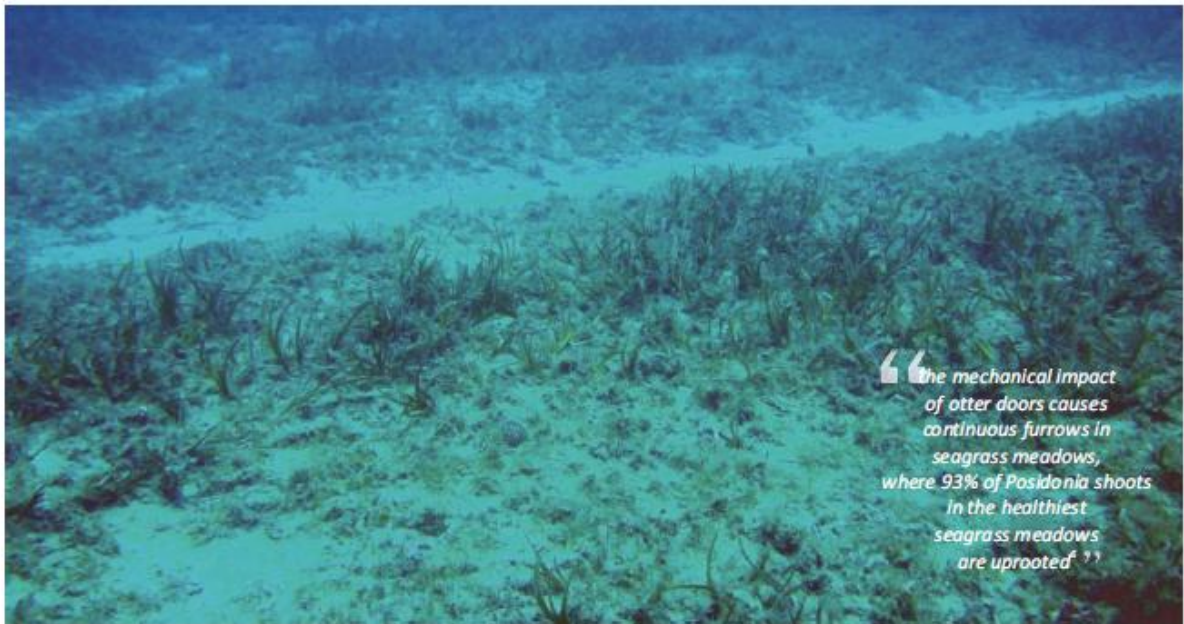


slow growing:

Posidonia oceanica is a large, long-living but very slow-growing seagrass. Its shoots, which are able to live for at least 30 years, are produced at a slow rate from rhizomes which grow horizontally by only 1-6 cm each year. Over centuries the rhizomes form mats which rise up into reefs that help to trap sediment and mediate the motion of waves, thus clarifying the water and protecting beaches from erosion. *Posidonia oceanica* is an important habitat forming species and provides habitat for many species, nursery grounds for the juveniles of many commercially important fishes and invertebrates. *Posidonia oceanica* is also grazed on by the Green Sea Turtle (*Chelonia mydas*).

Source: Pergent, G., Serrão, R., Djilali, A., Langer, H. & Duarte, C. 2010. *Posidonia oceanica*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. www.iucnredlist.org.





The damage caused by trawling is linked to the lead weights fixed to the lower part of the net's opening, which keep it in contact with the seabed, and to the heavy 'otter boards' fixed to the net, in a way that widens the opening of the trawl. Trawling opens up furrows in the *P. oceanica* meadow, uproots 100,000 to 360,000 shoots per hour⁽⁴⁾, severely reduces the seagrass cover and induces resuspension

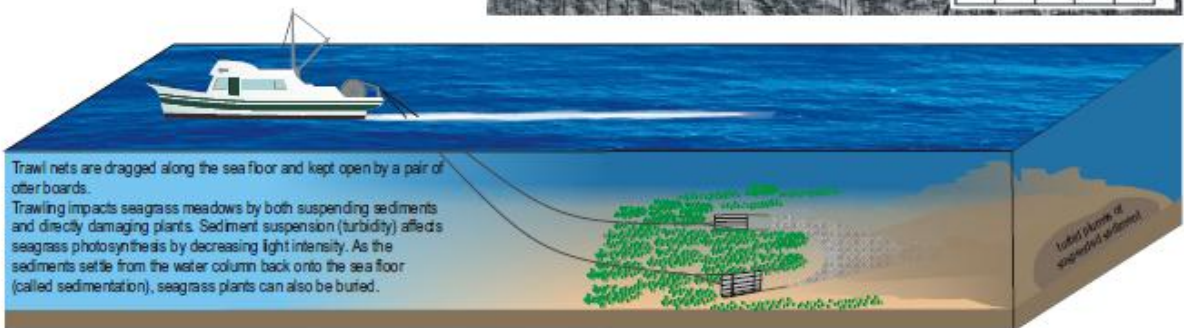
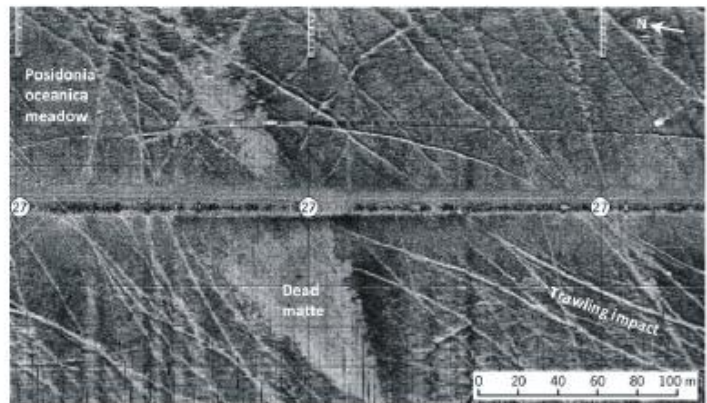
of the sediment. In addition, trawling constitutes a vector of dissemination of invasive species (e.g. *Caulerpa taxifolia* and *C. cylindracea*).

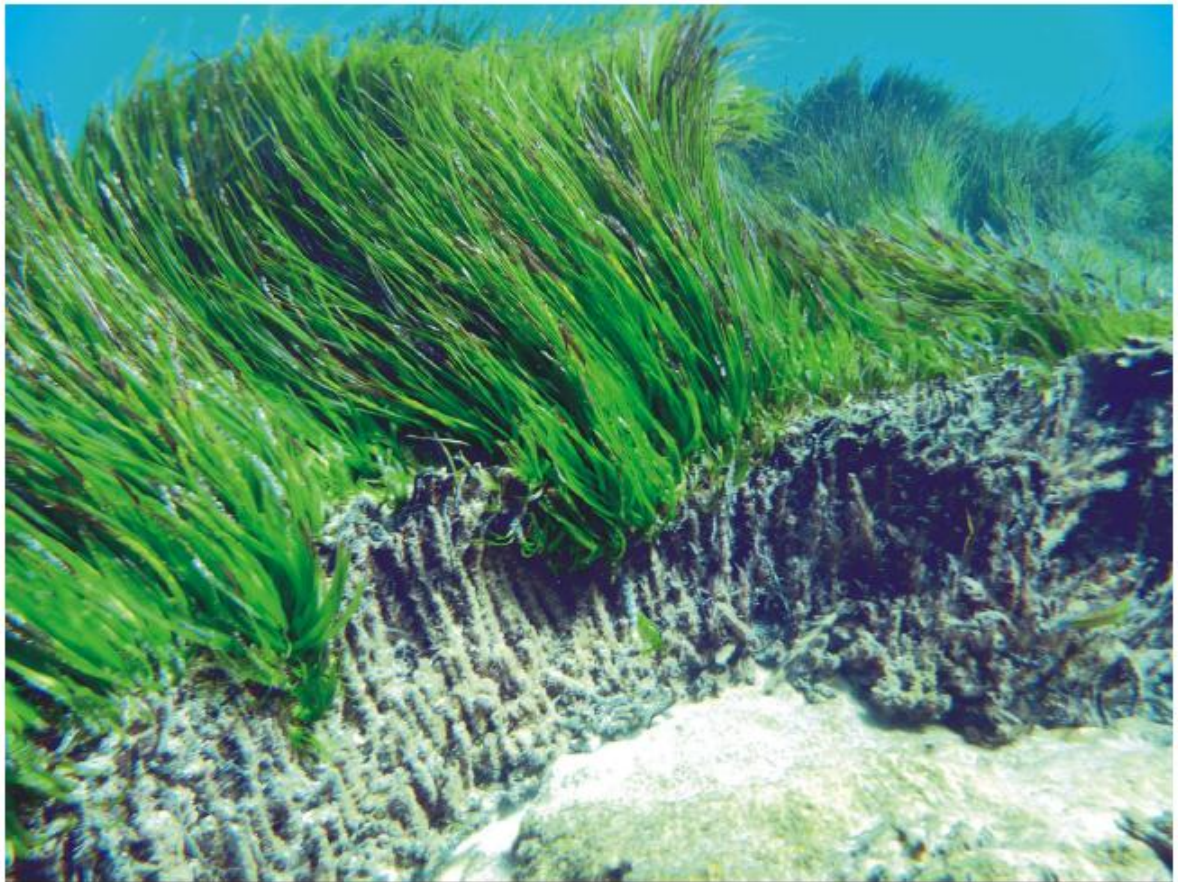
Otter trawling has also resulted in major changes in the structure of demersal communities with differences in fish assemblages inhabiting healthy and disturbed *Posidonia* meadows^(5,6).

The effects of trawling on the megabenthos in *Posidonia* meadows has resulted in the reduction or elimination of species typical of hard bottoms and their replacement by ubiquitous species and others typical of sandy/muddy bottoms, as a result of the sediments being enriched with finer particles^(5,6).

meadow scarring:

Traces of trawling detected along Cap Corse (France) with the help of a side-scan sonar (right) and validated by divers (top). Efforts have been made to prevent physical damage caused by trawler-fishing by placing artificial reefs, consisting of spiked concrete blocks, along certain stretches of the coast, and also by mounting a coastal watch to prevent illegal trawling.





Threats:

Posidonia oceanica is threatened at depth by mechanical damage from trawling, boat anchoring, and turbidity. Coastal development including shoreline hardening, urban and harbour infrastructure, and sand mining affect the upper limit of *Posidonia* meadows. Eutrophication (fertiliser from agriculture and urban waste) and pollution, especially in coastal regions that are heavily populated, is a problem. Fish farm activities and aquaculture affect surrounding *Posidonia* meadows. Invasive species also compete for habitat (e.g., seaweeds species such as *Caulerpa taxifolia* and *Caulerpa cylindracea*). Climate change will be an additional threat through warming of waters (in excess of 28°C) and erosion from sea level rise.

Posidonia oceanica is protected by EU legislation (Habitat directive), the Bern and Barcelona Conventions and national legislation (10 Mediterranean countries such as France, Spain, Italy, etc.). Fishing regulations limit trawling activities near the shore (either above 50 m or a certain distance from the coast), which constitute an indirect protection measure for the species (EC Council Regulation N° 1967/2006 and national regulations).

Source: Pergent, G., Semroud, R., Djelouai, A., Langar, H. & Durin, C. 2010. *Posidonia oceanica*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. www.iucn.org

Trawling has caused marked reductions of some *P. oceanica* meadows: 12% of the surface area in northeastern Corsica, France; almost 50% in the region of Alicante, Spain; at least 80% in the Gulf of Gabès, Tunisia; and trawling is the main cause of deep meadow losses along the Latium coast, Italy⁶.

Recovery of seagrass meadows may occur after trawling is banned, but the very low growth rate of *P. oceanica* rhizomes (a few centimetres per year) results in a recuperation time in the order of at least one century⁷.

To ensure seagrasses continue to thrive in the Mediterranean coastal waters, they must be protected from bottom trawling and fishing pressure reduced as much as possible; current regulations banning trawling on *Posidonia* meadows in most Mediterranean coastal areas need to be enforced and greater areas of seagrasses included in marine protected areas totally closed to fishing. Campaigns to raise awareness together with effective monitoring and surveillance may be an effective way forward⁸.

References

1. Short FT & Wyllie-Echeverria S. (2008). Global seagrass decline and the impact of climate change. In: CRC Sheppard (Ed.), "State of the millennium: an environmental evaluation", Pergamon, Elsevier, Amsterdam, 3: 10-1.
2. Pergent et al. (2012). Mediterranean seagrass meadows: Resilience and contribution to climate change mitigation. Grand, Seagrass and of Milaga, Spain: IUCN. 40p pages.
3. Brudonnesque et al. (2008). Botánica Marina, 52: 395-418.
4. Martín et al. (1997). Publ. Espec. Inst. Esp. Oceanogr. 23: 243-53.
5. Sanchez-Jerez & Ramos-Espá (1996). Journal of Aquatic Ecosystem Health 6: 239-253.
6. Sánchez-Lizaso et al. (1993) Rapp Comm Int Mer Méd 32: 7.
7. Gozkalz-Cornas et al. (2005). J. Exp. Mar. Biol. Ecol. 320: 65-75.
8. Tudela (2004) Ecosystem effects of fishing in the Mediterranean. General Fisheries Commission for the Mediterranean. Studies & Reviews no. 74.