



SUSTAINABLE FISHERIES

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Pulse Trawling, Tradeoffs, and Managing new Technology

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Earlier this year, the European Parliament surprised commercial fishermen by voting to ban a type of electric fishing that had shown some environmental benefits. This method, called “pulse trawling” has proven to reduce bycatch and lower fuel consumption, however may lead to equity issues among fishers. [BLOOM Association](#), an environmental group based in Paris, led opposition to pulse trawling and called the vote “a tremendous victory for the ocean, for artisanal fishers and Europe.” In February, Australia’s Southeast Trawl Fishing Industry Association (SETFIA) [added their criticism](#).

Bottom trawling accounts for **about 20%** of global landings, but receives a disproportionate amount of criticism for its potential to drastically impact marine ecosystems if done carelessly. “Beam trawls in particular have been the focus of environmental concern as they cause a substantial reduction in abundance of biological mass of animals living on the seabed,” explained **Michel Kaiser**, Chair of Marine Conservation Ecology at Bangor University, in January.

Instead of dragging a beam and chains across the bottom, pulse trawlers use bursts of low-voltage electricity to startle fish into fleeing from the ocean floor, ideally ending up in the net that hovers a few feet above. This is particularly effective on soles, which are sensitive to electric shock, thus reducing bycatch of other groundfish and minimizing seafloor damage. The gear is also lighter than a traditional bottom trawl, and can be pulled slowly, making it more fuel-efficient.

A comprehensive study on the subject is pending and not due to present results until 2019, but there are pressing ecological and ethical questions. **Some studies have shown spinal fractures in larger cod to be an adverse effect of pulse trawls that targeted soles.** While this may be an ethical concern worth examining, Kaiser argued an, “ethical discussion needs to be framed in the context of the injuries sustained by fish in trawls which can be equally undesirable.” Aquarium experiments on the effects of electric shock to shrimp and worms proved such species to be very resilient, but these have not been repeated in the wild.

The Dutch government invested heavily in this technology dating back to 2006 and stands to lose the most in the wake of this ruling. Last year, 28% of the Dutch trawl fleet used electric fishing methods. At present, the decision from Parliament would set a cap for all EU countries at 5% of each country's fleet to be allowed to use pulse trawling.

BLOOM argued that the research on bycatch from pulse trawling is inconclusive, and pulse trawling creates an even greater disadvantage for small-scale fishermen than presently exists. Instead, BLOOM advocates for using gillnets to reduce habitat impacts.

Socioeconomic obstacles might present a greater challenge than missing ecological research at this time. "The pulse trawl fleet has encroached on grounds that historically were fished only by fishermen using low impact gears," and inspired "resentment and conflict with other stakeholders."

Bob McConnaughey of the NOAA Alaska Fisheries Science Center echoed this concern; "an unforeseen negative aspect of the use of electric stimulation is that the reduction in overall trawl weight opened up new grounds to fishing with this type of gear that previously could not be fished due to the softness of the seabed (causing the net to fill with mud and sand)." An anonymous comment sent to Sustainable Fisheries UW suggested the Dutch fleet was able to undercut French sole prices due to saved fuel costs from switching to the lighter pulse trawls. This claim was not substantiated, but it raised a legitimate question of equity in the sole fishery.

In most of the management comparisons we have done (considering primarily benthic impacts), we typically found that one action leading to a particular benefit often requires another to address some negative consequence(s). For example, a spatial closure of an area typically leads to displacement of effort, which then leads to increased impacts in the area that the effort moves to. Depending on the relative sensitivity of the biota living in the two areas, the overall net consequences may be negative but will certainly shift the impact...unless the effort affected by the closure is also specifically removed from the fishery.

Bob McConnaughey

Because pulse-trawling is a truly different fishing method, it merits its own management considerations and cannot be lumped with beam trawl or other traditional bottom trawl restrictions. In the immediate future, the spatial conflicts described by Kaiser and McConnaughey must be resolved. For long term proliferation of pulse trawling in the EU or in any bottom trawl fishery, increased efficiency in catching the target species must be thoroughly evaluated.



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