



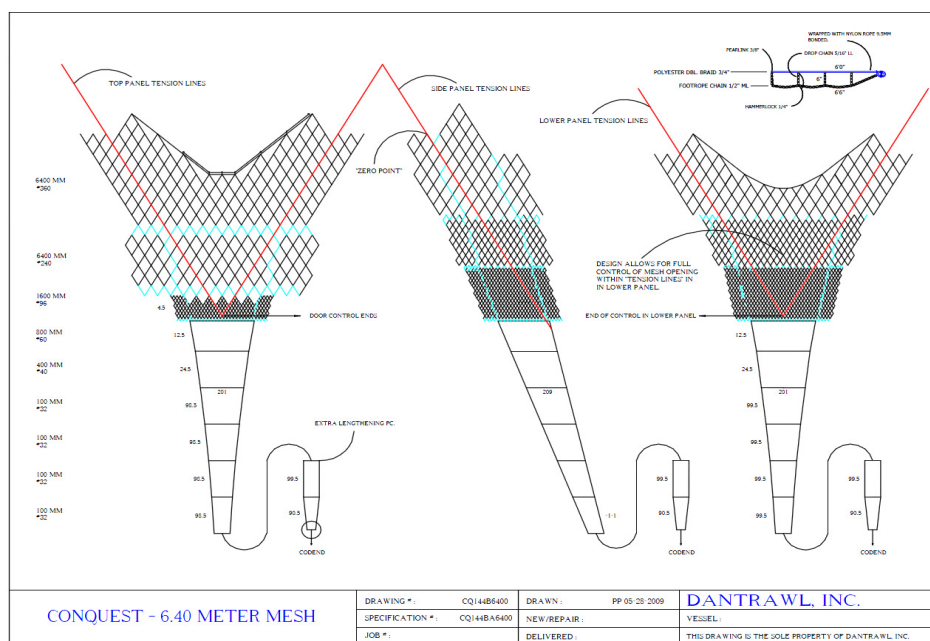
Design and Test of an Innovative Large Mesh Whiting Trawl to Reduce Spiny Dogfish Bycatch in the Southern New England Whiting Fishery

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Small mesh trawls for whiting (silver hake, *Merluccius bilinearis*) and red hake (*Urophycis chuss*) are managed as exemptions from the Northeast Multispecies Management Plan. In southern New England whiting fishery, spiny dogfish (*Squalus acanthias*) has become a major problem in southern New England whiting fishery, as it can plug the codend, and squash targeted whiting. Recently, DMF has been a development project testing a grid to reduce dogfish bycatch though the result has not yet been available. Despite of these efforts, bycatch of spiny dogfish and smooth in whiting fishery in Southern New England is still the major problem. Abundant dogfish bycatch has prevented harvesting of whiting in recent years in Southern New England. A new trawl to harvest whiting and reduce or eliminate dogfish would help utilize the whiting resource and reduce dogfish mortality, contribute to financial well-being of the industry and spiny dogfish resource sustainability.

This project was to test a new large mesh whiting trawl, designed by Dantrawl Inc. of Seattle, WA for the Southern New England whiting fishery. The goal of the proposed research is to reduce bycatch of spiny dogfish in the southern New England whiting trawl fishery through the design and test an innovative large mesh semi-pelagic trawl. Specific objectives are to:

- Design a large mesh semi-pelagic trawl suitable for the southern New England whiting fishery;
- Construct a full-scale trawl system by a gear manufacturer and rent it to the project;
- Conduct sea trials to evaluate the design's effectiveness in retaining whiting and reducing dogfish and other finfish and flatfish, and evaluate its operation and handling in the fishery; and
- Conduct outreach and technology transfer upon successful sea trial results.



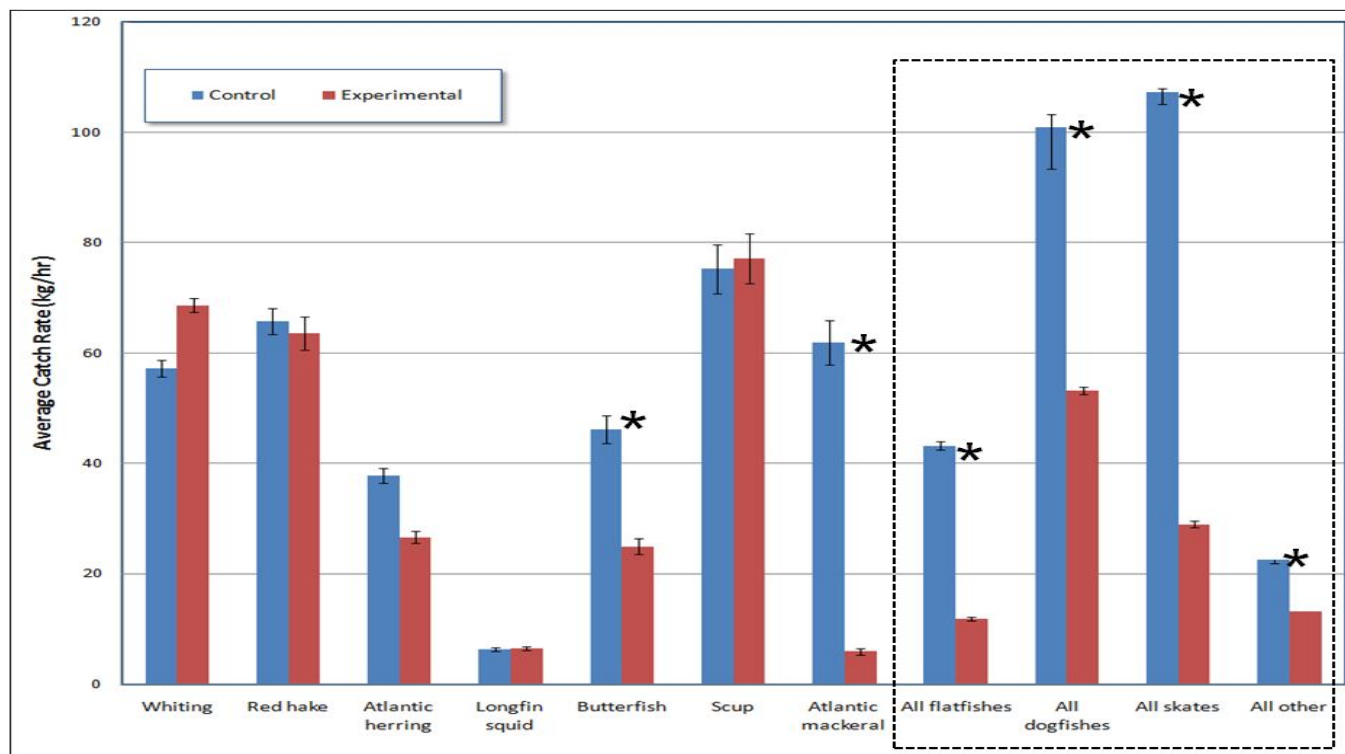
Started in April 2010, this project has been a true collaboration among a scientist, a gear manufacturer, and the fishing industry. The purpose of the project was to demonstrate if the large mesh trawl, which has been proven in

Alaskan Pollock fishery, can maintain or increase whiting catch while reducing bycatch of spiny dogfish. A full scale large mesh whiting trawl was designed and fabricated, and necessary modifications were made after initial sea trials.

A pair of trawl doors (Thyboron Type 15VF, 4.5 m²) which can operate both on and off bottom were purchased. Sea trials started in September 2010 with F/V “Cody” and F/V “Enterprise”. At the end of that segment, gear rigging was finalized. Sea trials continued in April/May 2011 during which 37 paired tows were completed. Thirty-six paired tows were valid pairs, with one pair being excluded because the codend was not brought on the vessel due to excessive dogfish in the control gear.

From the analysis of the valid 36 pairs, it was found that the new gear increased catch of targeted whiting by 20% (mean 57.2 kg/h control vs. 68.6 kg/h experimental), but the increase is not statistically significant (non-parametric paired randomization test, N=36, p=0.09). Catches of red hake, squid, and scup were similar between the control and the experimental trawls (N=36, p>0.05). The new trawl significantly reduced the catch of spiny dogfish by 48% (p=0.03), butterfish by 46% (p=0.01), flounders (yellowtail, windowpane, winter, and four-spot) by 73% (p<0.001), and skates (little and winter) by 73% (p<0.001), when compared with the commercial trawl.

While the new trawl achieved the project’s goal of maintaining targeted whiting catch and reducing bycatch of dogfishes, the results need to be viewed with caution, as the overall and individual catch rates were quite low (0 to 215 kg/h). More comparative experimental tows are required in the range of commercial catch rates before the new trawl can be recommended for commercial use in the Southern New England whiting fishery.



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