

Exploring Bycatch Reduction in the Haddock Fishery Through the use of the Eliminator Trawl with Fishing Vessels in the 250 – 550 HP Range

Review # 1.

The intention of this study was to evaluate the performance of a proven technology, the Eliminator Trawl”, when applied to smaller vessels with lower horsepower. The investigators scaled down this gear to accommodate small and medium sized draggers.

The investigators were funded for 2 main components, the construction of the trawls, and for 6 day of testing of each net, with the hope of accomplishing between 25 and 35 paired tows with each design. The smaller net was tested in the Gulf of Maine, while the larger net was tested on Georges Bank.

By and large the investigators accomplished their goals. They successfully completed 33 and 36 pairs with the smaller and larger nets, respectively. While this sample size is rather small, they had statistical success for most of the species they intended to address. The results are somewhat inconclusive for the smaller net, but this may be driven by sampling problems (bathymetry) rather than the gear itself (see advice below). The larger of the nets appears to have been successful in eliminating much of the bycatch and has definite potential for management. It should be tested further.

I have a couple of recommendations. The investigators note that their data for the smaller net may have been confounded due to the bathymetry in the Gulf of Maine. They point out that when towing side by side, at times the vessels were fishing in significantly different depths. Standard procedure in these cases is to tow end to end (or nose to tail) along a contour, to ensure vessels are sampling at the same depth. Finally, in the future the PI’s should consider employing a larger scientific staff for these operations. This would eliminate the need for sub-sampling for weight, which is always problematic in selectivity studies.

Review # 2.

The report both reads and is organized well but lacks information to adequately evaluate the effectiveness of the gear modification. Because of the lack of information, I do not believe that there is sufficient information to assess the relative catch rates between the control and experimental gears. This could be rectified if additional information is provided.

In the description of the gear, it appears that the two Eliminator trawls and their corresponding control nets are not well matched. The report does not provide information regarding the headrope, footrope, (except for the 184 x 40 HL in the trawl diagram) sweep, or other net details except for the size of the fishing circles. The Eliminator fishing circle mesh size is reported in centimeters while the control fishing circle mesh size is reported in inches. When a conversion is made, it appears that the fishing circles of the Eliminator trawls are much larger (1/3 larger) as compared to the control gears. In

addition, there is no mention if the two gears used similar sweeps (ground gear). Without this information it is impossible to tell if the differences in catch between the Eliminator and control are attributed to an improved net design, a modification to the sweep (e.g., if the Eliminator used a raised footrope and the control did not) or some other aspect of the gear. This problem of potentially disproportionate fishing power is supported by the data of the 250 x 40 Eliminator trawl (Table 5). If the nets were configured similarly, you would not expect the control to catch only 1/3 the catch of haddock when compared to the Eliminator. Finally, there is no mention of any mensuration data to suggest that the two gears (control and experimental) are relatively similar. There is not even a statement that there was an attempt to match the controls and Eliminators. I think it is important to inform the reader if the two gears had similar swept areas (e.g., door spread and wingspread) so that there is information on the relative fishing power between the two gears to ascertain the importance of any differences in the catch data.

In regards to the data analysis, the choice of a sign test, not a robust test because it discounts the magnitude of differences, could lead to errors in accepting or rejecting the null hypothesis. Although the report states that the paired t-test was discounted because of non-normality of the data, it has been reported that the paired t-test is not very susceptible to the issue of non-normality and that more important is the issue of equality of the variances. Regardless, if the paired t-test is discounted, several other approaches could be used to investigate that data that incorporates the magnitude of differences between the gears. In addition, more information could be provided about the catch differences by looking at the differences relative to catch size related to other variables, e.g., do you see more or less loss when total catch is greater. Because the data analysis discounts information that could be valuable in assessing the comparative catch efficiency between the two gears, I would like to see the data investigation expanded to discount the concerns that can be raised if only a sign test is used to evaluate the data. Without this, I am left speculating that the analysis was not performed because the results become less clear when a more robust statistical analysis is used.

Because of the two major concerns listed above; (1) the lack of information on the relative similarities between the control and treatment gears, and (2) the omission of a robust statistical analysis to fully investigate the data, I am concerned that assumptions about the effectiveness of this Eliminator trawl are not fully supported by the report. These concerns could be alleviated by providing both a better description of the gears showing their similarities and describing their differences, and by providing a more in-depth analysis of the data that does not omit the comparative differences in the magnitudes of catch retained by the respective gears.