July 9, 2014

REDNET Draft Final Report for Component 3 – Codend Selectivity
NEFSC review comments

This report is not written in a common scientific format which makes it a little difficult to follow and makes interpreting the results rather difficult at times. For example, there seems to be some conflating of the 'Methods' and 'Results and Discussion' sections, and the 'Results and Discussion' section incorporated methods on the trawl monitoring and codend processing. However, the methods that they employed, though different from what they proposed, appear sufficient to ascertain selection curves for the three mesh sizes tested for this vessel fishing this gear during the months of March and April.

Some minor concerns:

The "Manual of Methods of Measuring the Selectivity of Towed Fishing Gears" published by the International Council for the Exploration of the Sea (Wileman et al., 1996) recommended that in a trouser trawl, "there is a greater risk of unequal catches in the two codends and hence a greater variance in calculated selectivity parameters. It is recommended therefore that the panel should extend the full length of the trawl, from the footrope to the codend openings". In this report, the panel did not start until it was 47.5 meshes behind the footrope, so there is potential for bias if fish separate by size class. The PIs did switch the control and the experimental codend from the starboard to port side during the tests of each different mesh size, so it is likely that this process helped reduce a potential side bias. The PIs state that they were going to follow the methods in (Wileman *et al.*, 1996) but since the ICES manual was published in 1996, there may be work that is more recent suggesting that the configuration that was tested is preferred. Additionally, the PIs had stated that they were going to use the covered codend method yet opted to use the trouser trawl method. I would have liked the discussion to include information on why they decided to use an alternative design than what was proposed.

Another minor concern is that the proposal originally contained the testing of seven mesh configurations 6.5" diamond and square, 5.25" diamond and square, 4" diamond and square, and 2" diamond using the covered codend method. The report states that they abandoned the square mesh configurations due to "sticking of fish" but do not elaborate – does 'sticking' indicate gilling? As the spines of the redfish rake backwards, I would like a better explanation why square mesh codends were abandoned. Additionally some brief explanation why they tested 5.5" and 4.5" mesh instead of their proposed 5.25" and 4" would help understand the background of the development of this testing.

Another minor concern is that the PIs had proposed to use underwater video to ensure the proper functioning of the gear, yet there is no mention of any underwater footage collected. The underwater footage would have validated their configuration. Since they did analyze the data to detect a side bias, and did not find one, this suggests that the gear was operating as intended.

The infrequent changing of the test codend raises some potential concerns. This protocol had the potential to introduce other sources of variability into the comparison (different area, different seafloor, different fish concentrations, different weather conditions, different depths

etc.). Perhaps it was not logistical feasible to change more often, but the potential effect of these other sources of variability should be discussed in more detail.

Variable tow duration is a concern. Again, the logistical reasons for this are clear, but there should be some discussion of the possible ramifications of this decision on the study results. Clearly escapement could be related to tow time.

The statement that wave heights up to 10 feet are "unlikely to substantially affect net performance" should be attributed to peer-reviewed research or at least a statement by the captain. As presented here, it seems like an arbitrary statement based on no evidence.

Figures:

Fig. 1 – It would be helpful to color code the locations according to which mesh size was being tested.
Fig.2 – Gear diagrams very hard to read – need higher resolution.
Fig 3 - There seems to be little or no correlation between depth and wire – this seems odd.
-Tow speed ranged from 2.6 – 3.3 – should discuss the possible ramifications of different tow speed on results.
-Tow duration seems to decrease over time – was this simply a function of greater concentrations of fish later in the study – again a possibility for bias here.

Although the work was sufficient to produce selectivity data for the mesh sizes tested on this one vessel during the spring, DeAlteris, and Grogan (1997), and Pope *et al.* (1975) showed that Selection Factors (SF) for selectivity studies are often inconsistent. Additionally, twine type, hanging ratio, seasonal morphology differences, tow speed, and many other factors are known to affect the SFs (Wileman *et al.,* 1996). If more refined SFs are needed, this work should be repeated on other vessels and other seasons to get a better understanding of the variance around the SFs.

Despite the caveats and potential sources of bias mentioned above, the analysis and results appear to be sound and compelling. I agree with the conclusion that that the larger mesh sizes currently required are unlikely to result in acceptable volumes of redfish to justify a commercial effort. Given the lack of substantial bycatch noted in this study, it would be interesting to see if this extends to other areas and other seasons as this would provide a greater justification in allowing smaller mesh sizes. I also agree with the conclusion that knowing when escapement is occurring during the trawling process would be a valuable piece of information, however, without estimates of post-escapement mortality during each phase of the tow, this information will be of limited value.

References:

DeAlteris, J., and Grogan, C. 1997. An analysis of harvesting gear size selectivity for eight demersal groundfish species in the NW Atlantic Ocean. Fisheries Technical Report No.1. University of Rhode Island.

Pope, J.A., A.R. Margetts, J.M. Hamely, and E.F. Akytiz. (1975). Manual of methods for fish stock assessment, part III. Selectivity of fishing gear. Food and Agriculture Organization Fisheries Technical Paper. No. 41 (Rev. 1). 65 pp.

Wileman, D., Ferro, R.S.T., Fonteyne, R., Millar, R.B. (Eds.), 1996. Manual of methods of measuring the selectivity of towed fishing gears. ICES Coop. Res. Rep. No. 215.