

12-1-2012

Reducing Yellowtail Flounder Bycatch in the Sea Scallop Dredge Fishery: Twine Top Modifications

Kelli Milleville Wright

Virginia Institute of Marine Science

David B. Rudders

Virginia Institute of Marine Science

William D. DuPaul

Virginia Institute of Marine Science

Follow this and additional works at: <https://scholarworks.wm.edu/reports>



Part of the [Aquaculture and Fisheries Commons](#)

Recommended Citation

Wright, K. M., Rudders, D. B., & DuPaul, W. D. (2012) Reducing Yellowtail Flounder Bycatch in the Sea Scallop Dredge Fishery: Twine Top Modifications. Marine Resource Report No. 2012-13. Virginia Institute of Marine Science, College of William and Mary. <http://dx.doi.org/doi:10.21220/m2-wse6-6p25>

This Report is brought to you for free and open access by W&M ScholarWorks. It has been accepted for inclusion in Reports by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.

**Reducing Yellowtail Flounder Bycatch in the Sea Scallop Dredge Fishery:
Twine Top Modifications**

Kelli Milleville Wright
David B. Rudders
William D. DuPaul

Virginia Institute of Marine Science
College of William and Mary
Gloucester Point, VA 23062

VIMS Marine Resource Report No. 2012-13

November 5, 2012

The use of annual catch limits (ACL) to monitor and account for the disposition of marine resources has focused the issue of bycatch for many fisheries. The sea scallop fishery is no exception and in particular has been struggling with the bycatch of yellowtail flounder. By exceeding annual catch limits for this species, the scallop fishery has been subject to premature closures of access areas and is now facing potentially more drastic accountability measures as the mechanism to account for yellowtail bycatch overages is implemented on a fishery wide basis. Flatfish in general and yellowtail flounder in particular appear to be susceptible to capture in sea scallop dredge. Both researchers and managers have been actively exploring options to mitigate this impact. In general, two broad approaches exist to reduce the impact that a fishery has on bycatch species. The first is the institution of spatial-temporal approaches that attempt to limit the interaction of the fishery with respect to the bycatch species. For example, closing a discrete area during the time of year when a certain species is present can be effective in reducing the bycatch of that species. There is a cost, however, as this limits a fishery with potentially extensive time-area closures. The second approach is gear based and hinges in engineering the fishing gear to minimize the capture of the species of concern. We report on the results of a series of scallop dredge modification experiments aimed at reducing yellowtail flounder bycatch in scallop dredges.

One component of the sea scallop dredge that has shown promise in reducing finfish bycatch is the twine top. During 2006 and 2007, VIMS in collaboration with the sea scallop industry conducted at-sea trials in the access area of Georges Bank Closed Area II to investigate the impact of modifications to the twine top with respect to finfish bycatch and scallop catch (Milleville, 2008). The first experiment examined the relative effect of different twine top hanging ratios on two similarly rigged 15 ft. New Bedford style sea scallop dredges. One dredge was equipped with a twine top that was hung with a 1.76 (60 meshes on 34 rings), while the other was rigged with a hanging ratio (HR) of 2.64 (90 meshes, on 34 rings). Both dredges had twine top lengths of 8.5 meshes and an apron of 7 rings to the clubstick. In this configuration, the sweep chain was forward of the bottom of the twine top. The two dredges were fished simultaneously and the resulting catch data compared. Results indicate that the dredge equipped with the 1.76 HR twine top caught significantly fewer yellowtail flounder (10-15% by weight) with an increase in scallop catch of roughly 5% by weight. (Figure 1).

A second experiment investigated the relative effect of twine top length on finfish bycatch and scallop catch. One dredge was equipped with a short twine top (5.5 meshes on the side, with an apron of 13 rings to the clubstick). This resulted in the sweep chain being even with the bottom of the twine top. The other dredge had twine top with 8.5 meshes to the side and 7 rings to the clubstick. Both dredges had a 1.76 HR (60 meshes on 34 rings). Results indicate the short twine top (5.5 meshes) captured more yellowtail flounder (~30% by weight) and more scallops (~10% by weight) relative to the 8.5 mesh configuration (Figure 2). These results indicate that the twine top area aft of the sweep (i.e. in 8.5 mesh twine top) may be an important area for finfish as well as scallop escapement.

Overall, this series of experiments demonstrate that the twine top has the potential to be used as a component of a gear based solution to finfish bycatch mitigation. Dredges equipped with either high HR or short twine tops appear to capture more yellowtail flounder. These modifications may represent relatively simple approaches to reducing the capture of yellowtail flounder.

Figure 1 Percent changes are calculated for each cruise based on a modification in HR from 90:34 to 60:34. This modification was tested on 3 cruises (A-C) and the overall mean estimate is denoted by the star. Positive values indicate that dredges with the 60:34 HR caught larger mean catch weights than the dredge with the 90:34 HR.

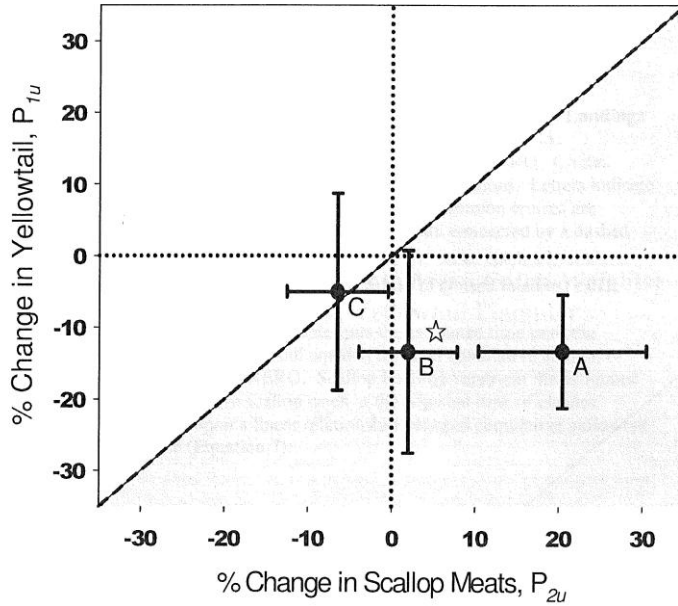
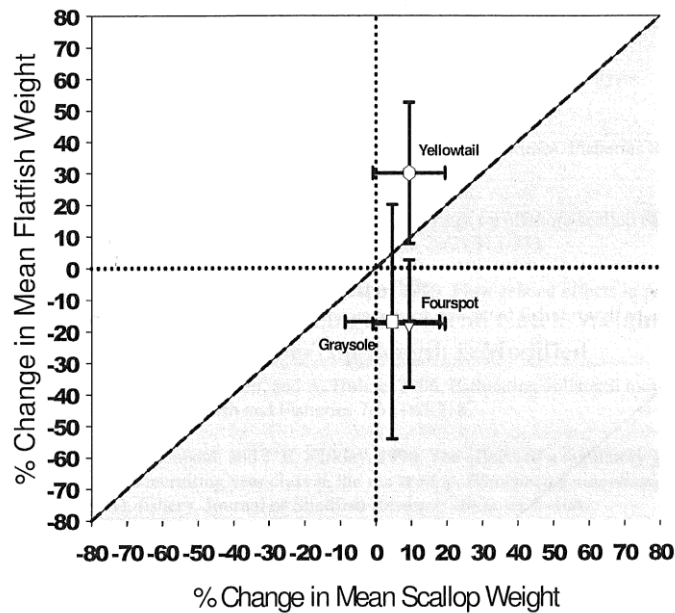


Figure 2 Percent change in flatfish catch are calculated for each species based on a modification to twine top length from 8.5 meshes to 5.5 meshes. Each point is labeled with its respective flatfish species and includes 95% confidence intervals. Positive values indicate that the dredge with the 5.5 mesh twine top caught larger mean catch weights than the dredge with the 8.5 mesh twine top.



Reference

Milleville, K.A. Twine top modifications of sea scallop dredges: reducing yellowtail flounder bycatch. Masters Thesis. Virginia Institute of Marine Science, College of William and Mary, Gloucester Pt., VA. 100pp.

This research was supported through the Sea Scallop Research Set Aside Program.