A Comparative Evaluation of a 3.5" Ring Dredge Versus a 4.0" Ring Sea Scallop Dredge Equipped with Sea Turtle Excluder Chains

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Recommended Citation
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Submitted to:
Stock Assessment Review Committee (SARC 39)
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts
April 2004


Not for Publication
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MATERIALS AND METHODS

Data Collection

This study conducted three research trips aboard the commercial scallop vessels F/V Celtic and F/V Pursuit into the Hudson Canyon Closed Area (September and October, 2003). The goal of this research was to evaluate the performance of the experimental gear with respect to both the incidence of sea turtle bycatch and the impact upon the catch of the target species: sea scallops.

The experiment employed a paired design: two dredges – one fitted with 89 mm (3.5”) rings and the other fitted with 102 mm (4.0”) rings – deployed simultaneously and towed side-by-side from the port and starboard gallow. The 4.0” inch ring dredge was fitted with a set of turtle chains. This chain configuration consisted of varying numbers of “up and downs” and ticklers. The F/V Celtic used 11 “up and downs” and 6 ticklers, while the F/V Pursuit used 9 “up and downs” and 5 ticklers. The variation in chain configuration was a function of dredge width. The dredges used aboard the F/V Celtic were 4.6 m (15’) wide, while the dredge used aboard the F/V Pursuit were 3.98 m (13’) wide. Regardless of width, the dredges were configured as identically as possible, except for the dimensions of the rings themselves. Fishing generally followed commercial practices, with the captain and crew selecting tow sites, tow durations, and size of culling, except that port and starboard catches were kept separate.

For each dredge the scientists collected data on (1) basket count (bushels of harvest size scallops deliberately retained by the crew for shucking and landing), (2) shell height frequency of all scallops including crew discards (width of the upper valve from the dorsal hinge to ventral extreme as measured on a standard NMFS measuring board and grouped into size classes of 5 mm intervals), (3) volume of “trash” (invertebrates and debris, in baskets), and (4) finfish bycatch frequencies (with the total length of all teleosts measured to the nearest centimeter; skates and other batoids were counted but not measured). For estimating shell height frequencies, the scientists took sub-samples,
usually measuring two or three baskets of retained scallops per side and usually one quarter of the discards. Sub-sampling of discards was systematic, with discards always selected from the same region of the port and starboard piles on any given tow, but from an ever-changing region of the piles on successive tows. Trash was sub-sampled from the same portion of the pile as the discards. The captain or mate of the vessel recorded the vessel position at the start (brake set) and end (initiation of haulback) of each tow, as well as the tow duration, velocity, and heading.

**Data Analysis**

The catch from all valid tows was summed to present the total catch from both the control and experimental gears. In addition, the catch of each size class of scallops by 102 mm rings relative to that of 89 mm rings was calculated both on a per tow basis and for the closed area as a whole.
Table 1
Hudson Canyon Closed Area

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<th>Shell Height</th>
<th>Mean Relative Catch</th>
<th>Number of Tows</th>
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Hudson Canyon Closed Area
Comparison of Size Distribution Retained by 3.5" and 4.0" Rings
(79 tows, 3 Trips, September and October 2003)