SEDAR 41 Red Snapper stock assessment must utilize "direct" estimates of gear selectivity

Peter Barile and David Nelson

SEDAR41-DW22

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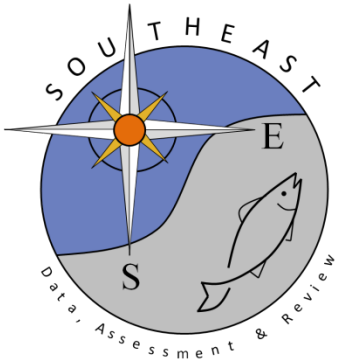

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Summary

The past South Atlantic Red Snapper stock assessment, SEDAR 24, unfortunately, estimated hook and line gear selectivities using data-poor information, which inexplicably produced flat-topped selectivity for significant South Atlantic hook and line fleets. This poorly-informed use of asymptotic selectivity for hook and line fleets, when direct experimental evidence for actual gear selectivity has been demonstrated to be dome-shaped, resulted in estimates of fishing mortality in SEDAR 24 that were biased high. We propose that "direct" selectivity information be utilized to develop the SEDAR 41 stock assessment model, utilizing direct measurements of gear selectivity from SEDAR 31 GOM Red Snapper and the State of FL's FWC fisheries independent experimental work on the South Atlantic red snapper stock. These "direct" gear selectivity studies are well informed with data on population structure, and therefore should be utilized as the most credible fleet selectivity estimates for SEDAR 41. The stock assessment model must also assign the appropriate gear (i.e. hook size) to achieve fleet respective recreational and commercial selectivity curves.

Critical information sources:

SEDAR 31 AW-12 Pollack et al. Estimation of hook selectivity on red snapper during a fishery independent survey of natural reefs in the Gulf of Mexico. This work indicates that knowledge of length distributions of sampled populations can be used to directly assess selectivity of gear (i.e. hook size). Analysis of hook size selectivity patterns indicates "dome-shaped" selectivity for small (8/0) and medium (11/0) sized hooks, but a logistical (flat-topped) selectivity for only the largest hooks (15/0).

SEDAR 31 RD-30 Patterson et al. (2012). Effect of circle hook size on reef fish catch rates, species composition, and selectivity in the north Gulf of Mexico recreational fishery. Direct selectivity was estimated for red snapper populations by utilizing laser-corrected length measurements from ROVs to provide length@age estimates. These stocks were then fished with 3 different sizes and combinations of circle hooks. For red snapper, both the 9/0 and 12/0 sized hooks displayed dome-shaped selectivity curves, while the 15/0 hook size was estimated to have a logistic-shaped selectivity function (see plot, below).

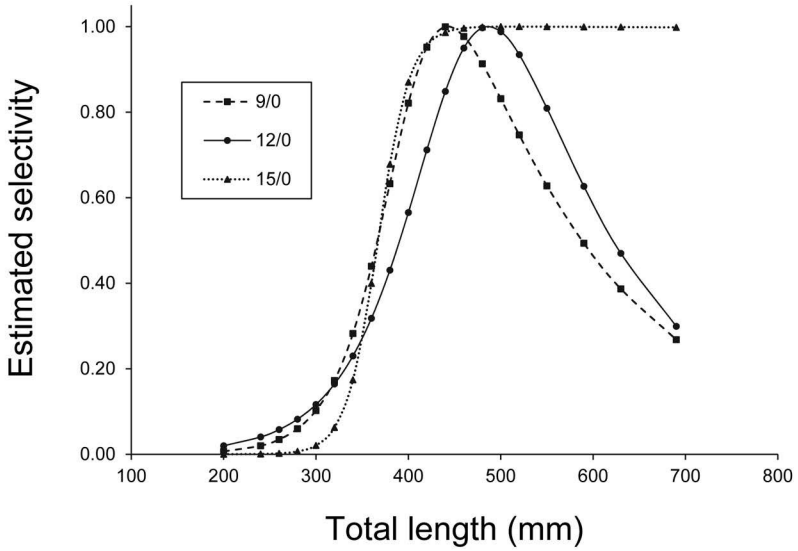

Figure 6. Maximum likelihood selectivity functions estimated for red snapper, *Lutjanus campechanus*, captured with 9/0, 12/0, and 15/0 circle hooks at reef sites in the northern Gulf of Mexico.

State of FL (FWC) Fisheries independent tagging/ gear-corrected catch efficiency analyses. Direct selectivity values for hook and line fleets in SEDAR 41 should be utilized from these fisheries independent hook and line catch data, from the South Atlantic, that are "hook-size" specific where age/length of catch and video information on local red snapper populations are available.