Comments On SPR-Based Benchmarks For Red Snapper Stocks In The Southeastern USA

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The available stock-recruitment observations for red snapper in the South Atlantic (SA) and Gulf of Mexico (GM) are insufficient to uniquely identify a stock-recruitment relationship to directly estimate MSY-based benchmarks for stock size and fishing mortality. This is a property common to many fish stocks around the world. In both red snapper stocks, and in line with the National Standard Guidelines, the Councils' SSCs have recommended use of SPR as proxies for the purpose of estimating MFMT and MSST levels. Throughout the nation, SPR proxies have been widely adopted for a broad range of stocks. Initial scientific guidance (in the mid-90s) indicated that SPRs in the range of 30-40% were reasonable proxies for MSY quantities for a range of fish stocks, although the precise SPR associated with MSY could be higher or lower depending on the actual underlying stock-recruitment relationship and fishery characteristics. In general, current scientific belief, based upon additional analyses taking features like recruitment variability into account (due to, for example, periods of favorable or favorable conditions), indicate that SPRs below 40% may not be sufficient to achieve MSY levels across a range of fish stocks with different life history characteristics and fishery conditions, but especially so for long-lived species. This evolution in scientific belief is manifested in the SPR proxies scientists currently recommend for use for a large number of west coast and northeastern US fish stocks, many with characteristics similar to red snapper.

The recent debate held by the SAFMC SSC on this topic provided ample evidence of the scientific uncertainty about the precise level of SPR that would best approximate the actual MSY benchmarks for the SA red snapper fishery as prosecuted, if scientific information were sufficient to determine that level. Recommending an SPR of 40% as the basis for the MSY proxy, in view of the current body of scientific information, falls within the range of acceptable levels. Further, the revision to the National Standard 1 Guidelines, published in Jan 2009, requires that the SSC's recommendation of an Acceptable Biological Catch take into account the uncertainty associated with the scientific information. In this case, the uncertainty associated with which SPR to use as the MSY proxy supports use of the more conservative $F_{40\%}$.

It should be noted that due to dependence of MSY benchmarks on biological, fishery, and environmental characteristics, one need not expect the actual MSY benchmarks for different stocks of the same species to be precisely the same, since these characteristics can be different. For GM red snapper, the recruitment estimates indicated an increasing tendency, in spite of quite depressed (and declining) spawning stock, in the most recent period, a feature not evidenced in the SA red snapper assessment. The reason for this is unknown, but was hypothesized to indicate the possibilities of recent changes in environmental characteristics toward more resilient or more productive levels and/or supplemental recruitment from outside the stock management area.

Biological reference points are intended to be measures of long-term productivity conditions. Indications of increased stock productivity, particularly recruitment in the GM red snapper stock, should not be construed as sufficient evidence to justify an SPR of 30% or less. Lower SPR levels could be poor approximations of F_{MSY} if the GM stock is subsidized by recruitment from other areas, or if the change in productivity is ephemeral. Both assessments find that current levels of spawning stock biomass are >90% reduced from historical levels and from levels that would occur in the absence of fishing. Such a decrease typically causes some decrease in the number of recruits produced by these spawners, but the available data in both areas are not sufficient to detect such a decrease and, in fact, both assessments indicate that the best estimate of recruitment trend is flat (SA) or increasing (GM). Future stock assessments should focus on investigating factors contributing to increased and sustained productivity of the GM and SA red snapper stocks, respectively.